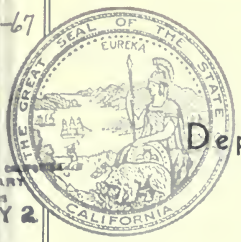

STATE OF CALIFORNIA
The Resources Agency
Department of Water Resources

BULLETIN No. 177-67

WATERMASTER SERVICE IN NORTHERN CALIFORNIA

1967 SEASON

June 1968

RONALD REAGAN
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DEPARTMENT OF WATER RESOURCES

RONALD REAGAN, Governor
WILLIAM R. GIANELLI, Director, Department of Water Resources
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Report data and text on the Indian Creek and Middle Fork Feather River Watermaster Service Areas were furnished by the Sacramento District

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ABSTRACT

The primary purpose of watermaster service is to distribute water among users in accordance with their established water rights. This is accomplished by apportioning available supplies in streams which have had water rights determinations./ Watermaster service was provided by the Department of Water Resources to 16 areas in Northern California during the 1967 watermaster season. They are: Ash Creek, Big Valley, Burney Creek, Butte Creek, Cow Creek, Digger Creek, Hat Creek, Indian Creek, Middle Fork Feather River, North Fork Cottonwood Creek, North Fork Pit River, Shackleford Creek, Shasta River, South Fork Pit River, Surprise Valley, and Susan River./ Essentially all of these areas experienced above-average water supplies during the 1967 irrigation season. The supply varied from average in some areas to the best year of record in others./ The bulletin is presented in two parts. Part I contains general information about water rights, water supply, and watermaster areas and duties. Part II contains specific information for each service area during the 1967 watermaster season, including available streamflow, methods and amounts of water distribution, and all other information pertinent to 1967 watermaster activities.

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1 ASH CREEK
2 BIG VALLEY
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STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

WATERMASTER SERVICE AREAS IN NORTHERN CALIFORNIA

SCALE OF MILES
20 0 20 40

PART I - GENERAL INFORMATION

Distribution of water in watermaster service areas is a continuing statutory function of the Department of Water Resources as provided in Part 4 of Division 2 of the California Water Code.

The primary purpose of watermaster service is to distribute water in accordance with established water rights. This is accomplished by apportioning available supplies in streams which have had water right determinations.

A major benefit of watermaster service to water users and the State is that court litigation and physical violence, which in past years occurred quite frequently, are essentially eliminated. Under watermaster service each water right owner is assured that his rights are being protected without his having to take legal action against other users. Another important benefit results from increased use of available supplies through reduction of wasted water.

Because both the water right owners and the State receive benefits from watermaster service, the costs of performing the service are shared. The State general tax fund pays for one-half the cost of operating a service area. The water right owners in the service area pay the other one-half.

Determination of Water Rights

Water rights determinations for purposes of establishing a watermaster service area may be accomplished by "statutory" adjudication, "court" adjudication, permit or license to appropriate, or by agreement.

The California Water Code (Sections 2500-2900) contains procedures whereby water users on any stream may petition to have the State Water Resources Control Board, Division of Water Rights, make a legal determination of water rights on that stream. If the Board finds that such a determination is in the public interest, it proceeds with a Statutory Adjudication. This adjudication ultimately results in a court decree which defines all water

rights on the stream.

A similar but less extensive method of defining water rights involves a "court" adjudication procedure. When an action is brought before the Superior Court in the county in which there is a water rights dispute, the court has two methods available for its settlement. It may refer the action to the State Water Resources Control Board for a determination under authority contained in Sections 2000-2076 of the Water Code. Or, it may make an investigation of the facts and render a decision without referral to the Board.

These court adjudications determine only the water rights of parties named in the action and therefore do not necessarily define all water rights on the stream. Consequently, they sometimes precipitate serious conflicts between decreed water right owners and persons claiming rights for riparian lands which were not considered in the decree.

Almost all of the streams under state watermaster service have had their water rights defined by the courts under one of the above adjudication procedures. These adjudications (decrees) establish each owner's water rights as to allowable rate of diversion, season of use, point of diversion, and place of use. They also establish priorities whereby each owner's rights are shown in relation to the rights of all other decreed owners.

Under the priority system all first priority rights must be fully satisfied before water can be diverted to any lower priority rights (second, third, etc.). When a shortage occurs within any priority, the available water is proportioned among all owners of that priority.

Description of Watermaster Service Areas

A watermaster service area may be created either by petition from water users (Section 4050 of the Water Code) or by order of a Superior Court.

The first watermaster service areas were created in September 1929, while the most recent addition was made in June 1964. Prior to 1929, some watermaster service was provided in accordance with the Water Commission Act of 1913. There are now about 50 streams in Northern California which are under state watermaster service. These are combined into the 17 service

areas shown on Figure 1. Fifteen are in the Northern District and two are in the Sacramento District. The Seiad Creek service area is presently inactive.

The service areas are located primarily in the mountainous northeastern part of the State where the growing season varies between about 100 and 140 days. Meadow hay and alfalfa are the principal crops under irrigation, although a considerable amount of land is used exclusively for pasturing livestock. Most irrigation is accomplished by gravity systems, with water users diverting directly from the streams at one or more diversion points. However, pumped diversions and sprinkler irrigation systems are becoming popular in some areas.

Table 1 lists all watermaster service areas in Northern California, the date each was created, and the corresponding decrees and agreements under which each is operated.

Schematic drawings of the major stream systems within each service area are presented in Figures 2 through 17. These drawings show the relative location of major roads, stream gaging stations, diversion points, and water right allotments for each diversion. The diversion points shown in these figures correspond to those listed in the respective decrees which define the water rights.

Watermaster Responsibilities

To assure the proper distribution of water within his service area, each watermaster must ascertain the amount of water available and distribute it both by amount and priority in accordance with established water rights. To accomplish his purposes, the watermaster is provided authority both by the Water Code and by provisions of pertinent court decrees or voluntary agreements, to physically regulate the various streams in a service area. He is further authorized to supervise the design, construction, operation and maintenance of diversion dams, headgates, and measuring devices.

Each watermaster supervises water distribution at approximately 100 to 200 diversions in one or more service areas. The frequency of visiting these diversion points substantially increases in years of short

TABLE 1

SUPERIOR COURT DECREES REGULATING WATER DISTRIBUTION

Watermaster Service Area	Name of Stream System	County	Decree			Date Watermaster Service Area Created	Remarks
			Number	Date	Type*		
Ash Creek	Ash Creek	Modoc ** and Lassen	3670	10-27-47	CR	4-03-59	Included as part of Big Valley service area 1949 through 1958.
Big Valley	Pit River	Modoc ** and Lassen	6395	2-17-59	S	11-13-34	Service provided in accordance with recorded agreement in 1934. Service area operated under recorded agreement 1935 through 1958, and under decree since 1959.
Burney Creek	Burney Creek	Shasta	5111	1-30-26	CR	9-11-29	Service provided in accordance with decree since 1926.
Butte Creek	Butte Creek	Butte	18917	11-06-42	S	1-07-43	
Cow Creek	North Cow Creek	Shasta	5804	4-29-32	CR	10-17-32	
	Oak Run Creek	Shasta	5701	7-22-32	CR	10-17-32	
	Clover Creek	Shasta	6904	10-04-37	CR	1-21-38	Included in Cow Creek service area.
Digger Creek	Digger Creek	Shasta and Tehama **	2213	8-12-99	C	6-11-64	
			3214	5-27-13	C		
			3327	10-16-17	C		
			4570	2-24-27	C		
Hat Creek	Hat Creek	Shasta	5724	5-14-24	CR	9-11-29	Service provided in accordance with decree since 1924.
			7858	10-07-35	CR		
Indian Creek	Indian Creek	Plumas	4185	5-19-50	S	2-19-51	
Middle Fork Feather River	Middle Fork Feather River	Plumas ** and Sierra	3095	1-22-40	S	3-29-40	
North Fork Cottonwood Creek	North Fork Cottonwood Creek	Shasta	5479	6-09-20	CR	9-11-29	Service provided intermittently in accordance with the decrae since 1924.
North Fork Pit River	North Fork Pit River and all tributaries except Franklin Creek	Modoc	4074	12-14-39	S	12-18-39	All stream systems consolidated into North Fork Pit River service area 12-13-40.

TABLE 1 (Continued)

Watermaster Service Area	Name of Stream System	County	Decree Number	Decree Date	Decree Type*	Date Watermaster Service Area Created	Remarks
	New Pine Creek	Modoc	2821	6-14-32	CR	6-22-32	
	Davis Creek	Modoc	2782	6-30-32	CR	7-13-32	
	Franklin Creek	Modoc	3118	9-08-33	CR	9-14-33	
	Cottonwood Creek	Modoc	2344	5-03-40	CR	12-13-40	
Seiad Creek	Seiad Creek	Siskiyou	13774	4-10-50	S	11-06-50	Service provided in accordance with decree by order of the court in 1950. Service suspended since September 1964.
Shackleford Creek	Shackleford Creek	Siskiyou	13775	4-10-50	S	11-06-50	Service provided in accordance with decree by order of the court in 1950.
Shasta River	Shasta River	Siskiyou	7035	12-29-32	S	3-01-33	
South Fork Pit River	South Fork Pit River	Modoc ** and Lassen	3273	10-30-34	CR	12-31-34	Service includes operation of West Valley Reservoir (built subsequent to issuance of decree) in accordance with the demands of South Fork Irrigation District.
	Pine Creek	Modoc	Agreement	11-22-33		1-12-35	
Surprise Valley	Cedar Creek	Modoc	1206	5-22-01	C	9-11-29	All adjudicated stream systems in Surprise Valley were consolidated into the Surprise Valley service area on 1-10-39. Bidwell Creek was added on March 16, 1960. Service started on Cedar Creek in 1926 in accordance with the decree. Service was provided on Soldier and Owl Creeks in 1929 in accordance with the decrees by order of the court.
			2343	2-15-23	C		
	Soldier Creek	Modoc	2405	11-28-28	CR	9-11-29	
	Owl Creek	Modoc	2410	4-29-29	CR	9-11-29	
	Emerson Creek	Modoc	2840	3-25-30	CR	4-02-03	
	Mill Creek	Modoc	3024	12-19-31	CR	12-30-31	
	Deep Creek	Modoc	3101	1-25-34	CR	12-29-34	
	Pine Creek	Modoc	3391	12-07-36	CR	1-13-37	
	Rader Creek	Modoc	3626	6-04-37	CR	6-12-37	
	Eagle Creek	Modoc	2304	4-05-26	C	1-10-39	
			3284	11-05-37	CR		
	Bidwell Creek	Modoc	6420	1-13-60	S	3-16-60	
Susan River	Susan River	Lassen	4573	4-18-40	CR	11-10-41	
	Baxter Creek	Lassen	8174	12-15-55	S	2-16-56	
	Parker Creek	Lassen	8175	12-15-55	S	2-16-56	

* *Explanation of type of Decree:*

C Court adjudication (court makes determination from evidence submitted – no report of referee)

CR Court adjudication (referred to State Water Resources Control Board for investigation and report)

S Statutory adjudication (State Water Resources Control Board is petitioned by water users to make a determination of all water rights on a stream system)

** *Decree entered by the superior court of this county.*

water supply.

Permanent measurement and control devices, which the State requires at each owner's main point of diversion, are constructed by the water users under supervision of the watermaster. Installation of accurate, easily set, and lockable structures is a continuing objective of watermaster service, since once they are built, conflicts among water users almost always stop. Also, the watermaster's work is reduced greatly by good structures.

The watermaster is often called upon to make immediate field or on-the-spot interpretations of various court decrees, agreements, etc. Since most of these documents were written more than 30 years ago, many situations have developed that were not initially considered. Therefore, the watermaster must use sound, careful, and practical judgment in attempting to reach workable solutions to water disputes. To accomplish this he must possess a good understanding of California Water Law.

Water Supply

Water supply in the watermaster service areas is derived principally from unregulated runoff of small streams. Peak runoff, mostly snowmelt, occurs in the spring, with relatively small streamflow occurring in the summer and early fall. An additional supply from storage reservoirs or ground water is used in some areas to supplement natural streamflow.

In some service areas the water supply must be predicted in advance to determine the date watermastering will begin and to some extent, the manpower needed. The Department's Bulletin No. 120 series, "Water Conditions in California", is used to assist in these predictions.

Precipitation

The streamflow available for distribution is affected by total precipitation, amount of snowpack, air temperature, and the amount of precipitation received during the irrigation season. The latter is particularly important in the Upper Pit River-Surprise Valley areas, where about 25 to 30 percent of the annual precipitation occurs in

April, May and June. Spring storms, which are normally accompanied by cooler temperatures, materially affect both the supply and the demand for water.

Temperatures in the spring affect the demand for water and the manner in which snowmelt runoff occurs. A hot, dry spring depletes the water supply very early, even in years of normal snowpack. A cold, wet spring can extend the supply well into the irrigation season, but cold temperatures retard the growth of crops and are not necessarily desirable.

Data collected at representative snow courses showing the snowpack as of April 1, and May 1, 1967 are presented in Table 2. This information was obtained from the Department's Bulletin No. 120-67.

Table 3 presents information on precipitation at selected stations in the service areas. The seasonal precipitation gives an indication of the related water supply available for distribution and provides a basis for comparing the current year's supply with long time average supply.

Streamflow

The general water supply available for diversion within each watermaster area is determined from stream gaging stations placed at key locations in the main stream channels. The several major stations are installed and maintained either by the United States Geological Survey or by the Department of Water Resources as part of a Federal-State program for collection of year-round streamflow records. However, numerous other stream gaging stations are installed and operated by the watermaster during the irrigation season to provide supplemental information.

Additional gaging stations are often installed by the watermaster in selected diversion ditches to further assist him in proper distribution of the various water right allotments.

Table 4 presents runoff data at selected stream gaging stations in or near the service areas. Runoff data at stream gaging stations used by the watermasters are contained in tables following the description of each area. These data are used in conjunction with schedules showing total water rights to determine the adequacy or shortage of the water supply.

TABLE 2

SNOWPACK AS OF APRIL 1 AND MAY 1, 1967 AT REPRESENTATIVE SNOW COURSES

Watermaster Service Area	Snow Course*	Elevation (In feet)	WATER CONTENT OF SNOW (IN INCHES)				
			April 1 Average (1931-1960)	April 1 1967	In Percent of April 1 Average	May 1 1967	In Percent of April 1 Average**
Shackleford Creek	Parks Creek	6,700	34.1	36.9	108		
Shasta River	Middle Boulder No. 1	6,600	32.9	31.2	95	43.1	131
	Little Shasta	6,200	21.4	22.7	106		
Ash Creek	Blue Lake Ranch	7,300	10.3	12.5	121		
Big Valley	Eagle Peak	7,200	16.2	15.6	96		
North Fork Pit River	Cedar Pass	7,100	17.0	13.8	81	22.3	131
South Fork Pit River	Adin Mountain	6,350	14.0	16.7	119	2.5	18
Surprise Valley							
Burney Creek	Thousand Lakes	6,500	36.8	38.5	105	55.4	151
Cow Creek	New Manzanita Lake	5,900	7.2	9.1	126	17.2	239
Digger Creek	Burney Springs	4,700	2.5	3.7	148		
Hat Creek							
Butte Creek	Humbug Summit	4,850	12.4	12.4	100		
Susan River	Silver Lake Meadows	6,450	27.7	41.0	148	46.3	167
	Fredonyer Pass No. 1	5,750	9.3	10.8	116		
Indian Creek	Independence Lake	8,450	41.1	61.6	150	74.1	180
Middle Fork	Mount Deyer No. 1	7,100	24.6	31.4	128	40.8	166
Feather River	Rowland Creek	6,700	17.3	24.6	142	28.9	167
	Yuba Pass	6,700	31.8	44.0	138	58.3	183

* Snow courses are listed according to elevation within each major grouping of watermaster service area. They do not necessarily correspond to any specific river or creek.

** Data collected for selected courses.

Station Name	County	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total	Percent of mean
Fort Jones	Siskiyou	0.20	3.73	5.11	6.27	0.21	2.77	1.60	0.02	3.22	0.35	0.33	0.17	23.98	110
Ranger Station		1.59	2.77	4.02	4.06	3.14	2.21	0.98	1.11	0.81	0.35	0.34	0.40	21.78	
Happy Camp	Siskiyou	1.03	14.70	13.26	15.45	1.22	7.59	3.61	0.79	0.48	0.00	0.02	0.42	58.57	107
Ranger Station		4.07	7.25	10.41	11.31	8.24	6.45	2.72	2.16	1.06	0.38	0.17	0.74	54.96	
Yreka	Siskiyou	0.16	2.93	4.53	4.62	0.18	1.82	1.63	0.50	1.71	0.04	T	0.40	18.52	104
		1.45	2.00	3.30	3.19	2.29	1.61	0.92	1.03	0.86	0.27	0.39	0.45	17.76	
Chico Experiment	Butte	0.00	8.50	4.60	10.31	0.60	4.09	5.35	0.44	1.24	0.01	0.03	0.07	35.24	135
Station		1.46	2.41	5.12	5.03	4.43	3.29	2.31	1.16	0.44	0.01	0.07	0.33	26.06	
Redding Fire	Shasta	0.00	9.11	7.92	14.03	0.75	6.85	5.71	1.21	1.34	T	0.07	0.04	47.03	121
Station No. 2		2.27	3.76	7.26	7.69	6.19	4.90	2.95	1.74	1.31	0.11	0.13	0.61	38.92	
Hat Creek Pump	Shasta	0.00	4.66	3.38	5.69	0.30	3.64	3.44	1.37	0.84	0.26	0.03	0.07	23.68	131
House No. 1		1.30	1.83	2.93	2.85	2.84	2.02	1.35	1.26	0.77	0.28	0.16	0.47	18.06	
Bieber-Cary	Lassen	0.00	3.93	3.15	6.45	0.25	1.38	2.76	1.54	1.33	0.45	T	T	21.24	121
		1.48	1.90	2.71	2.58	2.24	1.96	1.48	1.48	0.88	0.20	0.17	0.42	17.50	
Lakeview, Oregon	Lake	0.17	3.63	1.78	3.47	0.37	1.78	2.28	1.27	0.67	0.01	0.13	0.73	16.29	113
		1.21	1.37	1.88	1.84	1.71	1.52	1.15	1.51	1.28	0.22	0.17	0.58	14.44	
Alturas Ranger	Modoc	0.15	2.78	1.48	3.05	0.15	0.94	1.58	1.05	0.87	0.25	0.10	0.11	12.51	98
Station		1.07	1.35	1.63	1.62	1.45	1.37	1.03	1.31	1.03	0.31	0.22	0.43	12.82	
Jess Valley	Modoc	0.26	3.03	1.80	3.13	0.61	1.81	2.96	2.14	1.60	0.43	0.47	0.30	18.54	108
		1.31	1.66	1.92	1.89	1.95	1.88	1.64	2.02	1.62	0.41	0.26	0.66	17.22	
Cedarville	Modoc	0.13	2.34	1.87	2.58	0.35	0.92	1.46	1.41	1.12	0.19	0.11	0.15	12.63	98
		1.17	1.41	1.69	1.84	1.50	1.45	0.99	1.04	0.94	0.33	0.15	0.37	12.88	
Susanville	Lassen	0.00	2.93	2.33	5.14	0.24	4.05	1.18	1.16	2.56	0.45	0.00	0.35	20.39	111
Airport		0.92	1.51	2.56	2.53	2.51	1.51	0.82	0.83	0.67	0.18	0.09	0.35	14.48	
Greenville	Plumas	0.00	11.58	9.02	15.83	0.86	9.55	3.70	1.27	2.55	0.20	0.20	0.22	54.98	128
Ranger Station		2.61	4.81	5.93	8.89	7.44	6.47	2.84	1.71	0.75	0.35	0.21	0.95	42.95	
Sierraville	Sierra	0.02	7.64	5.40	10.66	*	7.46	2.04	1.32	2.10	T	0.18	1.32	*	*
Ranger Station		1.83	2.76	4.49	4.94	4.23	2.84	1.63	1.25	0.54	0.29	0.15	0.44	25.39	
Vinton	Plumas	T	2.81	2.73	4.85	0.17	3.13	1.08	0.93	1.54	0.21	0.19	0.67	18.31	142
		0.89	1.44	2.12	1.94	1.87	1.43	0.84	1.01	0.50	0.36	0.18	0.25	12.91	

* *Date Unavailable*

Note: Figures above line are for current season; below line are long-term averages.

TABLE 4

RUNOFF AT SELECTED STATIONS

1966-67 SEASON
(In acre-feet)

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Total	Average *	Percent Average
Shasta River near Yreka	7,660	11,920	17,350	18,290	13,240	16,680	13,190	14,190	9,650	2,360	1,760	4,300	130,600	127,400	103
Hat Creek near Hat Creek	7,660	8,380	8,510	8,400	7,690	8,460	8,050	11,450	16,570	13,050	8,790	7,650	114,700	94,840	121
Pit River near** Canby														164,300	
North Fork Pit River near Alturas	44	906	2,220	6,020	7,180	2,880	5,250	14,670	5,230	292	41	47	44,790	32,650	137
South Fork Pit River** near Likely														51,910	
Susan River at Susanville	271	1,890	3,480	5,620	5,940	12,630	7,050	33,330	17,160	4,880	4,310	351	96,910	69,070	140
Indian Creek near Crescent Mills	2,100	12,400	34,750	67,050	59,230	121,400	65,730	187,100	105,000	14,390	3,030	2,520	674,700	385,900	175
Middle Fork Feather River near Cilo	1,190	6,540	22,750	53,750	47,460	92,460	31,450	70,130	49,480	9,960	3,080	3,330	391,600	196,900	199
Butte Creek near Chico	6,680	19,900	38,530	66,550	42,280	57,140	56,630	68,170	33,530	15,070	10,790	10,400	425,700	282,300	151

* *Average annual flow of record through 1963.*

** *Data unavailable at time of printing. Will be published in U.S.G.S., "1967 Water Resources Data for California, Part 1-Surface Water Records.*

Essentially all watermaster service areas experienced above-average water supplies during the 1967 irrigation season. The degree varied from near average in some areas to the best year of record in others.

PART II - 1967 WATERMASTER SERVICE

This part of the report gives a general geographical description of each watermaster service area and the major sources of water supply therein. The usual methods of distribution and the actual distribution of the water supply of the 1967 season are discussed. Special occurrences in some areas are also mentioned.

Ash Creek Watermaster Service Area

The Ash Creek service area is located in Modoc and Lassen Counties near the town of Adin. There are 32 water right owners in this area with total allotments of 123.65 cubic feet per second.

The major sources of water supply for the service area are Ash Creek and three tributaries, Willow Creek, Rush Creek, and Butte Creek. Ash Creek rises in the eastern part of the service area and flows westerly through the town of Adin into Ash Creek Swamp and then into the Pit River. Rush Creek heads in the northeastern part of the service area and joins Ash Creek above the town of Adin. Willow Creek and Butte Creek originate in the southeastern part of the service area and join Ash Creek near the head of Ash Creek Swamp. Each of these streams is independently regulated.

Approximately 85 percent of the water rights in the service area are in Big Valley, west of the town of Adin. The remaining water rights are along the upstream tributaries and in Ash Valley. The portion of Big Valley served is approximately 10 miles long by 6 miles wide, extending from the town of Adin to the confluence of Ash Creek and the Pit River. The valley floor is at an elevation of approximately 4,200 feet.

A schematic drawing of each major stream system within the Ash Creek service area is presented as Figure 2, page 17.

Water Supply

The water supply for Ash and Rush Creeks is derived primarily

from snowmelt, since most of the watershed is between 5,000 and 6,000 feet in elevation. Willow Creek and Butte Creek receive a substantial portion of their water from springs. These creeks normally have sufficient water to satisfy demands until about June 1, after which the supply decreases rapidly. By the latter part of June, Ash Creek normally has receded to about 20 cubic feet per second, Rush Creek to about two cubic feet per second, Willow Creek to about five cubic feet per second, and Butte Creek to less than one cubic foot per second. The flow of these creeks then remains nearly constant for the remainder of the season.

The daily mean discharge of Ash Creek at Adin is presented in Table 5, page 19. This stream gaging station is located below a substantial number of the points of diversion; consequently, the table does not include all of the available supply of this creek.

No stream gaging stations were installed on Butte, Rush or Willow Creeks during the 1967 season.

Method of Distribution

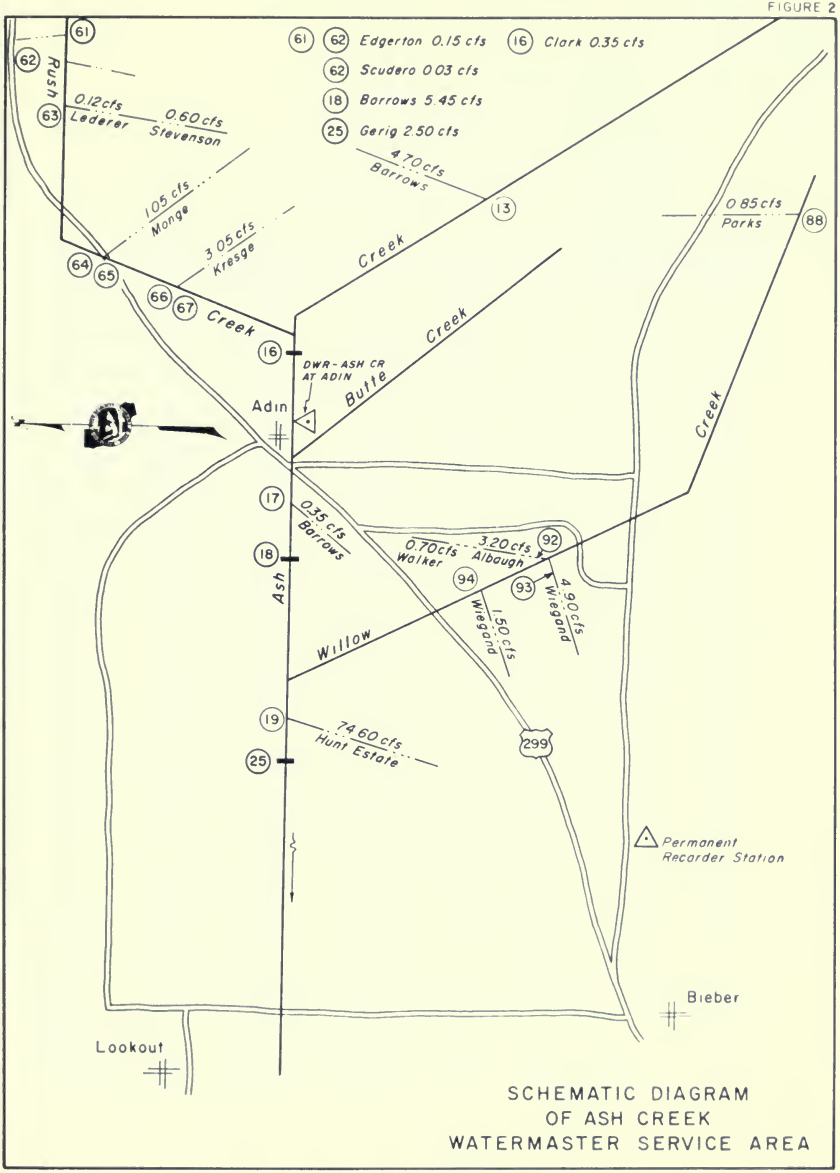
Irrigation diversions from Ash Creek and its tributaries are accomplished by small dams placed in the stream channels. Most of the users have several diversion ditches at these dams. These ditches convey the water to the fields where it is spread by means of small laterals. Some of the users employ a system of checks and borders; however, most of the land is irrigated by wild flooding. Return flow is captured by downstream ranches for reuse. In one case a rancher may recirculate his drain water before returning it to the creek for further use. In a few areas, pumps are used to divert the water into ditches or through sprinkler systems.

The Ash Creek decree (see Table 1) establishes the number of priority classes on the various stream systems within the Ash Creek service area as follows: Ash Creek - five; Willow Creek - four; Rush Creek - one; and Butte Creek - two.

1967 Distribution

Watermaster service began May 1 in the Ash Creek service area

FIGURE 2



SCHEMATIC DIAGRAM
OF ASH CREEK
WATERMASTER SERVICE AREA

TABLE 5
DAILY MEAN DISCHARGE

ASH CREEK AT ADIN

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	207	135	253	210	12	22	16
2	181	134	262	185	14	22	17
3	140	129	274	156	14	21	14
4	109	107	308	140	12	21	14
5	110	120	332	149	11	20	15
6	129	113	341	180	12	15	14
7	128	135	374	148	13	16	14
8	124	196	439	130	14	16	14
9	128	156	510	123	14	17	16
10	121	148	588	115	12	19	16
11	123	154	567	95	14	19	15
12	112	251	567	91	14	25	14
13	109	210	478	75	14	21	14
14	109	326	427	61	14	21	14
15	132	383	429	59	14	21	14
16	502	253	449	52	14	23	14
17	351	208	467	49	20	22	16
18	340	271	465	45	20	23	20
19	245	227	460	42	21	22	19
20	214	214	423	45	16	24	19
21	198	190	399	43	15	24	22
22	188	308	378	37	18	24	19
23	193	439	355	24	21	21	14
24	162	586	307	26	24	19	14
25	148	785	254	24	24	20	14
26	134	564	220	23	21	24	16
27	123	536	203	23	21	24	19
28	124	484	190	20	21	23	20
29	123	336	178	16	23	18	21
30	121	272	152	16	21	19	21
31	118		156		21	18	
Mean	169	279	361	80.1	16.7	20.3	15.8
Runoff in acre-feet	10400	16600	22220	4760	1030	1280	942

Big Valley Watermaster Service Area

Big Valley service area is located in Modoc and Lassen Counties in the vicinity of the towns of Lookout and Bieber. There are 53 water right owners in the area with total allotments of 231.03 cubic feet per second.

The Pit River is the major source of water supply for the service area. The river enters the valley north of the town of Lookout and flows southerly through the western part of the valley and out its southern end. The major place of use is about 13 miles of valley floor along the Pit River at an approximate elevation of 4,200 feet.

A schematic drawing of the Big Valley stream system is presented as Figure 3, page 25.

Water Supply

The available water supply in the Pit River as it flows through Big Valley is ordinarily adequate to satisfy all demands until about June 1. The irrigation practices in Hot Springs Valley, located about 20 miles upstream from Big Valley, have a significant effect on the available water supply in Big Valley throughout the remainder of the irrigation season. Water users in Hot Springs Valley divert most of the flow in Pit River for two or three week periods. Natural flow available for use in Big Valley during these periods is often less than 20 cubic feet per second. Periodic releases from channel storage reservoirs in the lower end of the valley sometimes increase the flow to as much as 200 to 300 cubic feet per second for relatively short periods. Consequently, equitable water distribution in Big Valley is very difficult to attain.

Roberts Reservoir, located on a minor tributary of the Pit River at the upper end of Big Valley above Lookout, serves as a supplemental source of water to those users in the area who are members of the Big Valley Mutual Water Company. Water from this reservoir is

released into the Pit River and distributed to members of the water company along with the natural flow to which they are entitled.

Records of two stream gaging stations in the Big Valley service area are presented in Tables 6 and 7, pages 27 and 28.

Method of Distribution

Most water users in the Big Valley service area irrigate on a rotation schedule by either wild flooding or by checks and borders. Large flashboard dams placed in the channel make it possible to use the large heads of water characteristic of the supply in the area. In addition, some pumps are used for diversion, both in ditches and directly into sprinkler systems. The ranches which irrigate by wild flooding must use large heads of water in order to cover unleveled or high ground. Much of the runoff is recaptured for use by downstream lands, resulting in a relatively high irrigation efficiency for the valley.

The Big Valley decree (see Table 1) provides for the distribution of water from Pit River in four priority classes.

1967 Distribution

Watermaster service began May 1 in the Big Valley service area and continued until September 30. Virgil D. Buechler, Water Resources Technician II, was watermaster during this period.

A near record snowpack, combined with continuing storms through April and May, provided a plentiful water supply. Many longtime residents had hay crops of record yield.

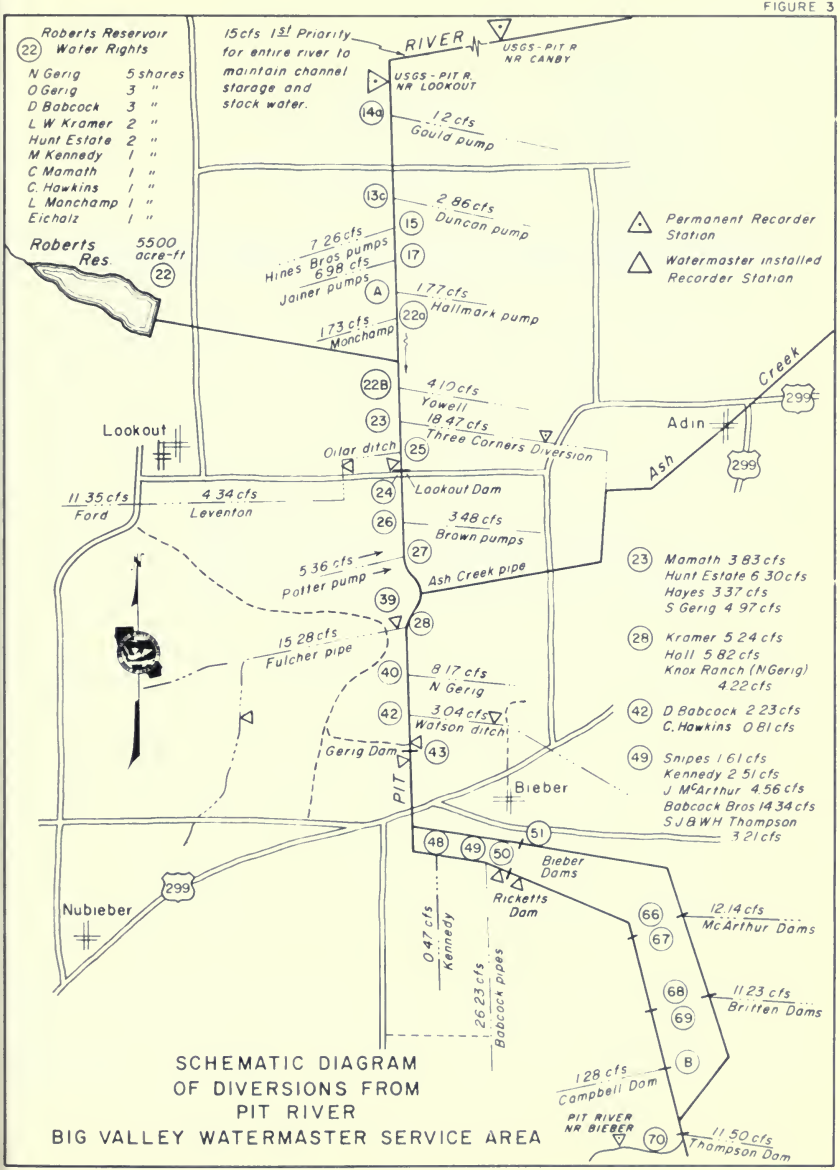
During May and early June, flows in the Pit River in Big Valley averaged more than 500 cubic feet per second. This greatly exceeded all demands and prevented installation of several flashboard dams. By June 5 the flow had decreased enough to allow the owners of the Bieber and Ricketts dams to place them in operation. The river is divided into two channels in this reach thus reducing the flows each dam must pass. On July 7 the flow had receded to about 200 cubic feet per second which allowed installation of the Lookout and Gerig dams.

By August 1, the first hay cutting in the valley was nearly completed and most ranchers were beginning to resume irrigation. However, large diversions by upstream users in Hot Springs Valley reduced the Pit River flow reaching Big Valley to 5 cubic feet per second. This necessitated the use of a rotation program. The watermaster allowed an irrigation allotment of 15 acre-feet for each cubic foot per second of second priority water right. Most of the water was required to fill the many channels and sloughs which had dried up during haying. Consequently, this period produced an insufficient irrigation.

On September 9 a similar and more successful irrigation rotation was completed. Releases from Hot Springs Valley then increased substantially, providing enough flow to allow two complete rotations of second priority allotments (four priorities) by the end of the irrigation season.

From August 2 to August 31 water was released from Roberts Reservoir for use by shareholders as follows:

Name	Shares	Acre-feet of Roberts Reservoir Water Used
Norris Gerig	5	100
Oral (Sam) Gerig	3	60
D. Babcock & C. Hawkins	4	240
L. W. Kramer	2	75
Hunt Estate	2	90
Merlin Kennedy	1	30
Cyril Mamath	1	--
Eicholz Ranch	1	100
Lewis Monchamp	1	--
	20	695



SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
PIT RIVER
BIG VALLEY WATERMASTER SERVICE AREA

TABLE 6
DAILY MEAN DISCHARGE

Pit River near Canby

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11	Data unavailable at time of printing. Will be published in U.S.G.S., "1967 Water Resources Data for California, Part 1-Surface Water Records, Volume 2: Northern Great Basin and Central Valley."						
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
Mean							
Runoff in acre-feet							

TABLE 7
DAILY MEAN DISCHARGE

PIT RIVER NEAR BIEBER

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	1070	670	1610	1070	16	2.0	2.5
2	1250	700	1410	1130	43	1.8	2.7
3	1010	676	1320	1130	334	1.7	11
4	760	610	1270	1160	278	1.3	17
5	658	565	1260	1150	212	1.1	7.6
6	585	545	1230	1110	231	0.8	15
7	580	550	1210	1120	209	0.7	12
8	610	565	1240	1050	179	0.6	6.4
9	605	625	1340	1000	138	0.6	13
10	610	730	1610	1140	89	0.6	8.8
11	712	712	2020	1160	47	0.6	6.8
12	788	700	2200	1130	32	0.6	3.1
13	694	730	2110	1070	21	0.5	0.7
14	736	837	1950	949	15	0.4	0.3
15	748	1130	1750	872	41	0.8	0.2
16	1400	1480	1560	781	54	1.3	0.1
17	2480	1390	1390	700	58	0.8	0.8
18	2930	1320	1360	625	36	0.7	2.0
19	2510	1380	1370	570	48	0.6	1.7
20	2090	1360	1420	442	34	0.5	2.3
21	1640	1130	1480	458	18	0.4	2.7
22	1390	1010	1550	418	14	0.4	1.8
23	1240	1030	1510	366	20	0.5	1.8
24	1190	1360	1370	346	24	0.6	3.8
25	1060	1920	1270	264	16	0.7	1.7
26	907	2410	1150	215	15	1.0	14
27	795	2460	1100	27	20	1.0	86
28	730	2240	1100	21	5.2	0.8	171
29	688	2120	1070	15	5.2	0.8	128
30	664	1850	1070	23	4.5	0.8	69
31	658		1070		2.9	1.8	
Mean	1090	1160	1431	717	72.9	0.9	19.8
Runoff in acre-feet	67020	69030	88010	42670	4480	53	1180

Burney Creek Watermaster Service Area

The Burney Creek service area is located in Shasta County near the town of Burney. There are 10 water right owners in the area with total allotments of 33.09 cubic feet per second. The source of water supply for this service area is Burney Creek, which enters the southern part of the service area and flows through Burney in a northerly direction to the Pit River. The portion of the valley served by this stream is approximately 11 miles long and two miles wide, and extends both north and south of Burney. The service area is at approximately 3,200 feet elevation.

A schematic drawing of the Burney Creek stream system is presented as Figure 4, page 31.

Water Supply

The water supply for Burney Creek comes from springs and snowmelt. Most of the watershed lies between the elevations of 4,000 and 7,500 feet on the northeast slopes of Clover Mountain and the west slopes of Burney Mountain. The creek normally has sufficient water to supply all demands until about the middle of June. The supply then gradually decreases until the end of July. For the remainder of the irrigation season, runoff from perennial springs keeps the flow nearly constant at approximately 40 percent of allotments.

The daily mean discharge of Burney Creek near Burney is presented in Table 8, page 33. The stream gaging station on Burney Creek is located below four points of diversion; consequently, the records do not show all of the available water supply of the creek.

Method of Distribution

The Burney Creek decree (see Table 1) sets forth a rotation schedule of distribution. The water users, however, have found it more beneficial to irrigate on a continuous-flow basis (one priority class

plus surplus allotments), which is now normal practice. The water allotted to the Greer-Cornaz Ditch is distributed in accordance with a supplemental court decree.

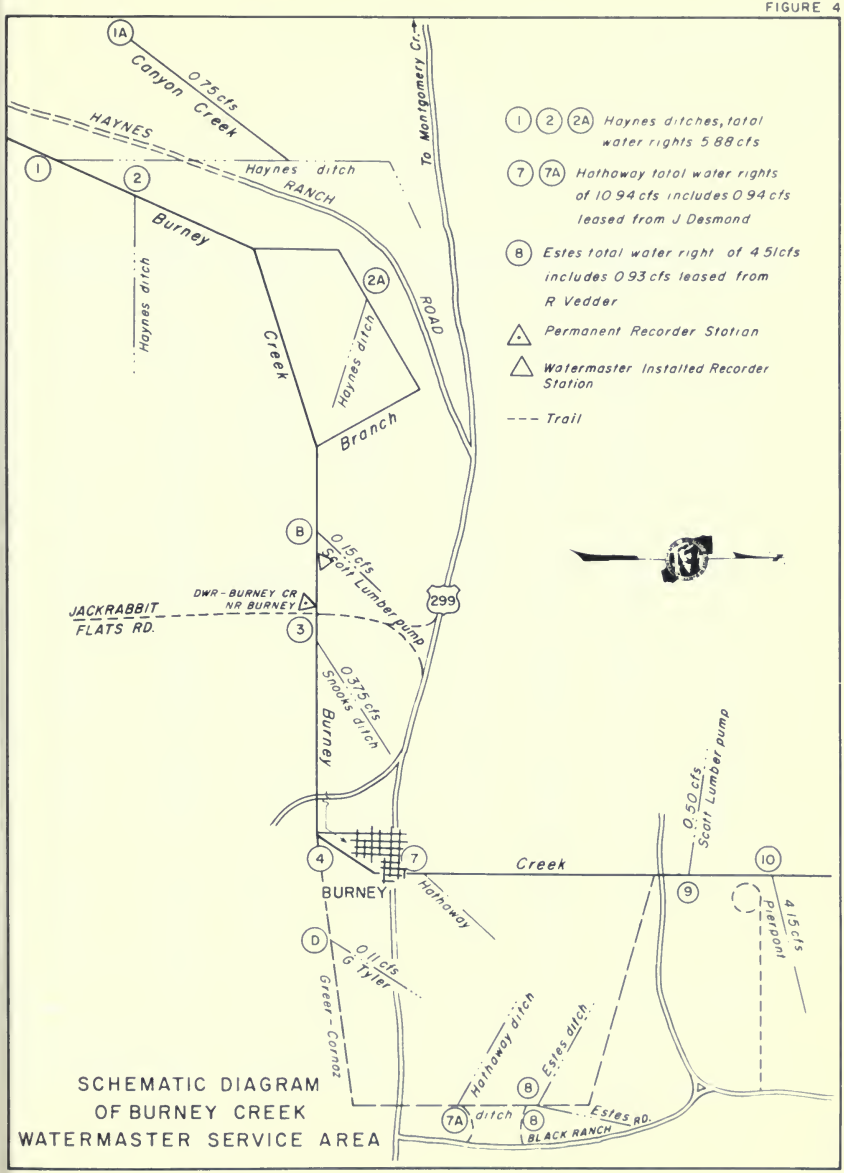
Water is diverted from Burney Creek, in most cases by means of low diversion dams, into ditches which convey it to the place of use. Lateral ditches are then used to irrigate the land. Scott Lumber Company uses a pump and pipeline to divert its allotment for industrial use.

1967 Distribution

Watermaster service began May 1 in the Burney Creek service area and continued until September 30. Virgil D. Buechler, Water Resources Technician II, was watermaster during this period.

All allotments were distributed on a continuous flow basis. This practice, rather than that of rotation called for in the decree, has been used for many years under agreement of the water right owners. The available water supply for the 1967 irrigation season was above average due to above normal precipitation during the late winter and spring months.

Surplus flow was available to all users until August 10, at which time all irrigation diversions were regulated to 100 percent of first priority allotments. Throughout the remainder of the season the flow remained near this level.



SCHEMATIC DIAGRAM
OF BURNEY CREEK
WATERMASTER SERVICE AREA

TABLE 8
DAILY MEAN DISCHARGE
BURNEY CREEK NEAR BURNEY
March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	78	127	90	286	56	19	14
2	79	122	88	292	54	18	15
3	78	118	93	248	52	18	16
4	72	112	98	176	50	19	16
5	70	109	112	153	48	19	14
6	69	120	141	153	45	20	12
7	71	124	139	157	43	23	12
8	72	117	165	156	40	24	12
9	74	113	236	224	41	21	13
10	95	117	334	182	40	20	13
11	130	110	343	157	40	20	14
12	96	102	279	186	37	20	15
13	84	101	242	202	31	20	15
14	82	114	260	141	30	18	13
15	81	119	297	134	29	15	12
16	271	114	346	129	30	16	14
17	269	107	383	119	30	16	16
18	262	107	415	115	29	16	21
19	201	108	469	113	27	18	18
20	199	109	536	105	27	16	18
21	191	104	539	107	27	15	18
22	198	96	602	103	31	16	19
23	299	92	636	95	30	15	18
24	225	93	588	83	26	16	16
25	189	102	489	77	23	16	16
26	165	112	435	72	23	16	16
27	147	113	402	70	24	16	16
28	155	113	411	68	23	16	16
29	148	107	367	64	23	15	15
30	138	96	312	60	22	15	16
31	137		277		20	15	
Mean	143	110	327	141	33.9	17.6	15.3
Runoff in acre-feet	8780	6540	20080	8380	2080	1080	910

Butte Creek Watermaster Service Area

The Butte Creek service area is located in Butte County near the City of Chico. There are 35 water right owners in the area with total allotments of 219.71 cubic feet per second. Butte Creek is the major source of water supply. The area served by this stream extends from about four miles east of Chico to the diversion of the Great Western Canal, about 11 miles south. It contains about 20,000 acres of valley floor lands at an average elevation of 150 feet.

A schematic drawing of the Butte Creek stream system is presented as Figure 5, page 39.

Water Supply

Butte Creek rises on the west slope of the Sierra Nevada Mountains in the northeasterly portion of Butte County, between Humbug and Humboldt Passes, at elevations of 5,000 to 6,000 feet.

Snowmelt normally produces sustained high flows until about the end of June, after which perennial springs at the headwaters continue to produce flows of more than 40 cubic feet per second. Additional water is imported from the West Branch Feather River by means of the Hendricks (Toad Town) Canal through DeSabla Reservoir and Powerhouse into Butte Creek. This imported water is rediverted at Parrott Dam to the Parrott Ditch.

Records of the daily mean discharge at several stream gaging stations in the Butte Creek service area are presented in Tables 9 through 11, pages 41 through 43.

Methods of Distribution

Water is diverted from Butte Creek by pumping and by gravity diversions. Parrott Investment Company, M & T Incorporated, Dayton Mutual Water Company, Durham Mutual Water Company divert relatively large amounts of water into several ditches leading to their individual

distribution systems. Various methods of irrigation are in general practice. These include contour checks, strip or border checks, basin checks, furrows, wild flooding, and sprinklers. The use of sprinklers has increased in popularity within the past few years, especially for use on orchards.

Water diverted from the West Branch Feather River through the Hendricks Canal and Desabla Powerhouse in Butte Creek has, in the past, caused wide fluctuation in the Butte Creek flow. In accordance with "Memorandum and Order" entered May 10, 1949, by the Superior Court of Butte County, water users below Parrott Dam (where the imported water is rediverted) must be provided their natural flow allotments at all times without undue fluctuation caused by intermittent presence of imported water. For the past several years PG&E has maintained reasonably steady releases which have greatly simplified this rediversion problem.

The Butte Creek decree (see Table 1) established three priority classes for summer distribution purposes and, in addition, defined two surplus flow allotments.

1967 Distribution

Watermaster service began June 1 in the Butte Creek service area and continued until September 30. Ross P. Rogers, Water Resources Engineering Associate, was watermaster during this period.

The available water supply for the 1967 irrigation season was outstanding. More low priority allotments were served for a longer period than in any other irrigation season since watermaster service began in the area in 1943.

Flow past the Gorrill Land Company's diversion dam, which is usually cut off in late May or early June, continued until mid-July. Deliveries to the White Ranch, the only water right owner in the service area below Gorrill Dam, were then made through Hamlin Slough for the remainder of the season.

Enough water was available to satisfy all demands in the surplus class until the third week in July, as some water users in

this class did not request their full entitlement. Near the end of July the flow had decreased, but was still adequate to serve the three highest priorities in the surplus class (six priorities in this class from July through September).

During the first week in August the flow in Butte Creek dropped rapidly. On August 7 there was enough water for about 50 percent of the first priority surplus class. Throughout the remainder of the month the flow decreased slightly, but still provided some water for this priority.

For a few days near the end of August and in early September the flow dropped below the surplus stage into the third and second priority allotments (three priorities) of the "regular summer schedule".

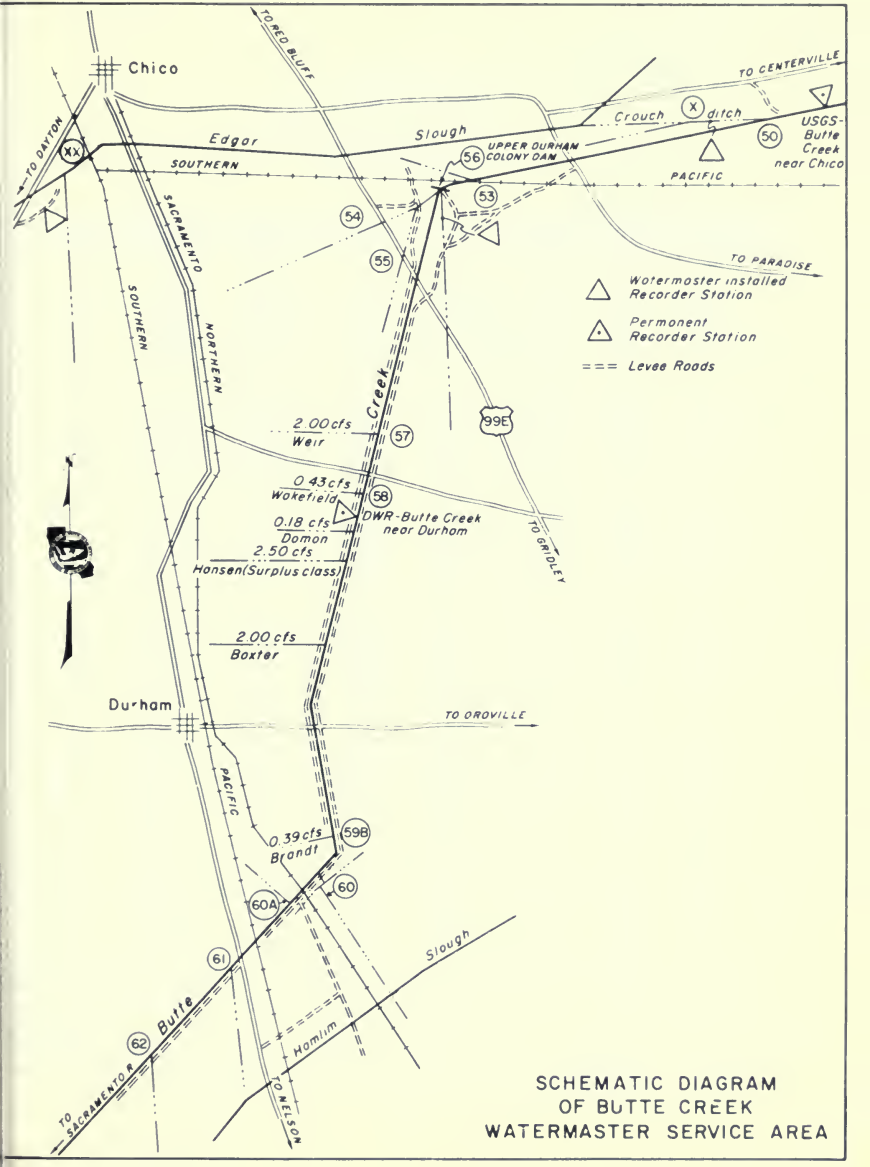
During the second week in September and continuing throughout the season the available water supply began to increase due to the gradual reduction of irrigation by many water right owners.

Special Occurrences

Several applications to appropriate surplus water during the spring months are presently under consideration by the State Water Resources Control Board, Division of Water Rights. If these applications are approved, the length of watermaster service to the area will probably be extended. Work would probably begin in late April or early May.

Several measuring devices are planned for construction prior to the beginning of the 1968 irrigation season. Those needed most are: a Parshall flume in the Gorrill Land Company's diversion ditch; a Parshall flume and two rectangular weirs to be placed in existing concrete structures in the Newhall Land and Farming Company's diversion system; a rectangular weir and concrete structure in Hamlin Slough; and repair of an existing Parshall flume in the Camenzind Brothers diversion ditch.

Diversion #	Water Right Owner	Amount in cfs	Remarks
Butte Creek			
50	M. & T. Incorporated	53.33	Imported water*
	M. & T. Incorporated	25.00	Surplus class
	Parrott Investment Company	53.33	Imported water*
	Parrott Investment Company	25.00	Surplus class
X	Taylor	3.00	
XX	Dayton Mutual Water Company	16.00	
	Dayton Mutual Water Company	3.33	Imported water*
	*Water imported by PG&E from West Branch Feather River via Hendricks Canal and released into Butte Creek, less 5% for conveyance losses at DeSabla Powerhouse.		
53	U. S. Department of Agriculture	2.00	
54	Patrick	3.33	
	Lavy	1.89	
	Smith	0.555	
	Roth	1.115	
55	Camenzind Brothers	3.11	
56	Durham Mutual Water Company	44.70	
	Parrott Investment Company	2.00	
	Carlson	0.48	
	Bell	0.39	
	Domon Brothers	0.67	
	Logan	0.01	
	Vernoga	1.447	
	Konyn	0.40	
	Bebich	0.446	
	Setka	0.447	
	Wheelock	0.26	
	Total	51.25	
60	Newhall Land & Farming Company	6.75	
	Newhall Land & Farming Company	21.25	Surplus class
60A	Phillips	0.66	
61	Gorrill Land Company	1.00	
	(See Hamlin Slough)	20.70	Surplus class
62	White	1.00	
		9.50	Surplus class
Hamlin Slough			
	Newhall Land & Farming Company	16.60	
	Gorrill Land Company	21.70	
	(Total diversions from Butte Creek and Hamlin Slough not to exceed 21.70 cfs).		



SCHEMATIC DIAGRAM
OF BUTTE CREEK
WATERMASTER SERVICE AREA

TABLE 9
DAILY MEAN DISCHARGE

BUTTE CREEK NEAR CHICO

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	415	852	712	816	344	188	183
2	405	765	712	747	334	187	184
3	405	744	728	679	319	187	180
4	395	751	760	674	309	183	176
5	385	883	790	704	302	182	175
6	380	1740	780	663	294	182	178
7	375	1510	920	658	290	182	177
8	375	1160	1120	644	281	181	177
9	375	1040	1250	650	272	179	178
10	415	1040	1370	632	270	179	178
11	955	1070	1160	623	268	179	181
12	800	947	1060	629	262	178	179
13	730	891	980	618	258	175	178
14	628	883	990	575	255	175	176
15	589	830	1110	562	244	174	176
16	3120	751	1270	555	233	174	176
17	2420	891	1360	563	232	173	176
18	1610	987	1380	551	220	170	157
19	1320	995	1380	566	219	170	179
20	1230	995	1400	547	212	170	176
21	1210	923	1420	518	211	170	174
22	1140	845	1440	487	205	171	176
23	1540	830	1440	459	200	171	180
24	1270	883	1420	443	196	168	177
25	1090	860	1300	429	197	168	176
26	971	830	1200	415	201	177	174
27	883	1070	1130	394	198	174	169
28	860	963	1060	382	195	169	168
29	800	852	960	370	196	167	157
30	808	772	920	353	192	162	152
31	907		846		190	175	
Mean	929	952	1109	564	245	175	175
Runoff in acre-feet	57140	56630	68170	33530	15070	10790	10400

TABLE 10
DAILY MEAN DISCHARGE

BUTTE CREEK NEAR DURHAM

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	380	988	778	710	97	35	8.3
2	354	889	752	658	94	32	10
3	354	854	752	590	89	30	10
4	337	863	744	568	84	29	12
5	319	970	761	582	68	23	12
6	302	1798	727	539	60	23	12
7	297	1660	838	532	60	19	12
8	297	1286	997	518	54	20	11
9	297	1150	1132	518	53	18	12
10	337	1123	1268	518	50	18	22
11	970	1190	1087	497	50	19	24
12	889	1069	988	490	53	20	19
13	812	1006	907	490	54	27	26
14	658	988	854	447	56	23	45
15	560	934	925	434	54	18	48
16	2854	863	1060	421	56	15	56
17	2578	952	1132	414	56	13	74
18	1730	1096	1132	421	58	11	58
19	1484	1132	1132	428	58	12	72
20	1370	1150	1170	401	51	16	82
21	1350	1051	1200	360	50	17	82
22	1286	961	1230	314	45	18	97
23	1600	925	1220	276	48	17	116
24	1420	988	1210	245	41	15	116
25	1250	952	1105	213	38	16	114
26	1114	925	1006	187	36	18	108
27	1024	1123	934	166	36	22	102
28	979	1051	898	148	34	16	108
29	925	934	804	122	35	17	105
30	943	838	770	108	38	14	105
31	1078		718		39	7.8	
Mean	973	1057	975	410	54.7	19.3	55.9
Runoff in acre-feet	59800	62890	59960	24430	3360	1190	3330

TABLE 11
DAILY MEAN DISCHARGE

TOADTOWN CANAL ABOVE BUTTE CANAL

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	119	115	124	119	119	80	100
2	119	119	126	119	118	81	98
3	118	120	125	118	116	80	95
4	117	120	125	117	116	78	93
5	117	115	124	118	116	80	93
6	118	114	124	118	117	80	94
7	119	116	124	119	115	81	94
8	119	125	124	124	114	80	95
9	119	125	124	124	107	80	95
10	123	127	126	124	106	80	95
11	114	124	125	122	111	81	98
12	102	121	125	119	114	81	96
13	100	120	123	119	110	80	97
14	109	124	124	119	105	81	95
15	113	125	123	119	102	78	95
16	119	125	122	117	98	82	95
17	114	123	123	117	95	81	89
18	127	117	123	118	90	80	76
19	126	121	122	119	87	82	95
20	124	120	121	119	85	81	92
21	121	121	119	119	83	83	93
22	121	122	122	118	81	83	94
23	126	123	122	119	78	83	96
24	124	123	122	119	76	81	94
25	125	124	129	119	81	81	92
26	126	124	130	118	87	86	91
27	125	125	130	119	83	81	89
28	126	123	122	118	82	80	86
29	126	121	121	118	82	79	72
30	121	122	121	118	80	79	69
31	117		119		81	93	
Mean	119	122	124	119	98	81	90
Runoff in acre-feet	7330	7230	7600	7090	6020	4990	5470

Cow Creek Watermaster Service Area

The Cow Creek service area is located in Shasta County in the foothills east of Redding. There are 88 water right owners in the area with total allotments of 56.366 cubic feet per second. The major streams in this area are: North Cow Creek (commonly called Little Cow Creek), Cedar Creek (which is tributary to North Cow), Oak Run Creek, and Clover Creek. These creeks, which are all tributaries of Cow Creek, flow in a westerly or southwesterly direction through narrow valleys joining Cow Creek near the town of Palo Cedro. The service area is located in the narrow valleys along the several creeks and consists of small parcels separated by brush-covered hills. The entire area is about 25 miles long by 10 miles wide and varies in elevation between about 500 and 2,000 feet.

A schematic drawing of each major stream system in the Cow Creek service area is presented as Figures 6 through 6c, pages 49 through 55.

Water Supply

Water supply for this service area is derived mostly from springs and seepage with some early snowmelt runoff. The watershed consists primarily of low brush hills which do not accumulate a heavy snowpack. Relatively large amounts of precipitation during the winter normally produce substantial springs and seepage that flow throughout the irrigation season.

Cedar Creek flow is usually sufficient to supply all allotments until about July 15, after which time it steadily decreases throughout the remainder of the season.

The flow of North Cow Creek is generally adequate to supply all allotments. In dry years it is necessary to reduce allotments during the latter part of the summer.

The flow of Oak Run Creek is augmented by a first priority allotment of five cubic feet per second of imported water from the North Cow

Creek watershed. The combined flow is generally adequate to supply all allotments throughout the season.

Clover Creek generally supplies enough water to meet all allotments throughout the season.

There were no stream gaging stations operated in the Cow Creek service area during 1967. Numerous stations were maintained in various diversion ditches.

Methods of Distribution

Water in the Cow Creek service area is used for domestic and stockwatering purposes and for irrigation of meadow hay, alfalfa, small orchards, and vegetable gardens. The alfalfa and hay lands are irrigated primarily by wild flooding, although some sprinklers are used. Furrows are used for irrigating gardens, and basins or checks and sprinklers are used for orchards. Much of the water applied is lost by surface runoff or by deep percolation, some of which returns to the creeks and thereby becomes available for rediversion downstream.

Only one priority allotment was provided in each of the Cow Creek service area decrees (see Table 1) except that the Oak Run Creek decree also contains a surplus allotment.

1967 Distribution

Watermaster service began June 15 in the Cow Creek service area and continued until September 30. Ross P. Rogers, Water Resources Engineering Associate, was watermaster during this period.

The available water supply for the Cow Creek service area was outstanding. An unusually late spring, combined with considerable rainfall and an excellent snowpack at higher elevations, produced the high sustained flows. Almost all water right owners received adequate water throughout the irrigation season.

Despite above average temperatures for extended periods, with their attendant high evaporation and ditch losses, a very successful irrigation season was enjoyed by most users.

Cedar Creek. Cedar Creek consistently has the lowest water

supply to water rights ratio in the Cow Creek service area. Even in years of adequate supply on nearby streams, the allotments on Cedar Creek are usually rationed severely.

However, because several water right owners did not use their full entitlements during the 1967 season all other users received an adequate supply throughout the summer.

North Cow Creek. The water supply in North Cow Creek was one of the best on record. Above normal spring rainfall contributed heavily to replenishment of the underground reservoirs which provide the major source of supply to the headwaters of the creek in the summer.

Even though most water right owners were diverting considerably more than their allotments, unused surpluses existed at the lower end of the creek until late July. Throughout August, historically a critical month, all users who could beneficially use surplus water were allowed to divert up to 200 percent of their allotments.

The flow in the creek decreased slightly in early September, requiring all diversions to be limited to about 125 percent of allotments for most of the month.

Oak Run Creek. The available water supply in Oak Run Creek was sufficient to supply all demands throughout the season. Several water right owners diverted amounts in excess of their allotments.

Water was available for irrigation of riparian lands downstream from the adjudicated area throughout the summer. This is an unusual occurrence.

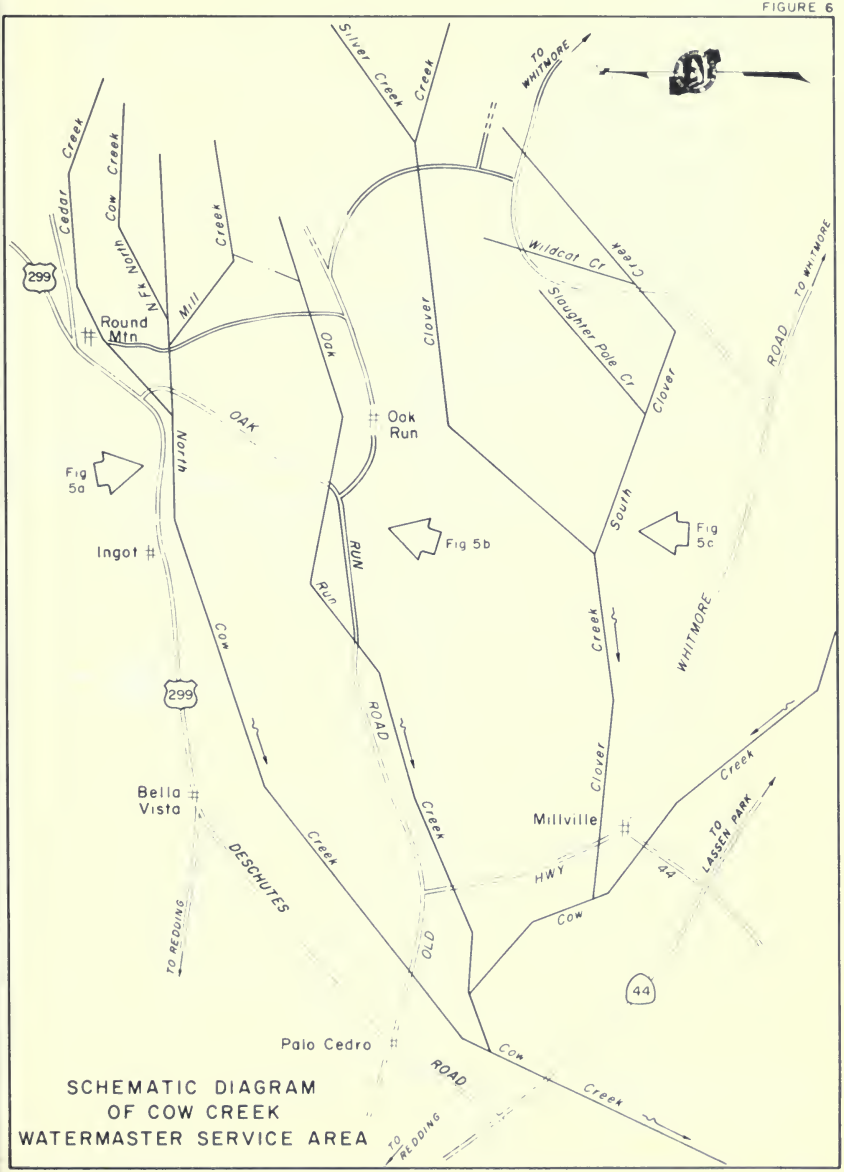
Clover Creek. The available water supply in Clover Creek was sufficient to supply all demands. Surplus water was available throughout the season.

Several water right owners diverted as much as 125 percent of their allotments during the normally critical months of August and September

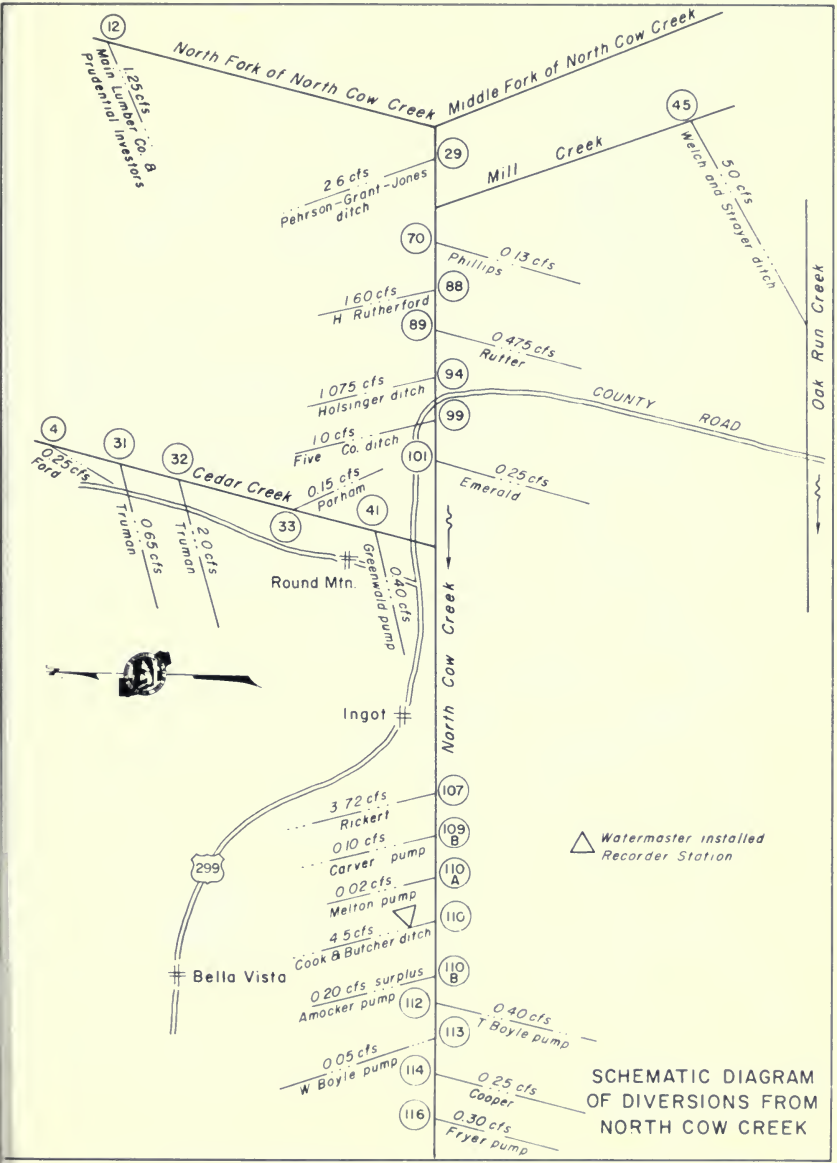
Special Occurrences

A two-foot concrete Parshall flume and a concrete control and spill-back structure with a screw-type metal headgate were constructed in the Worley Ditch on Clover Creek. Planned for construction prior to

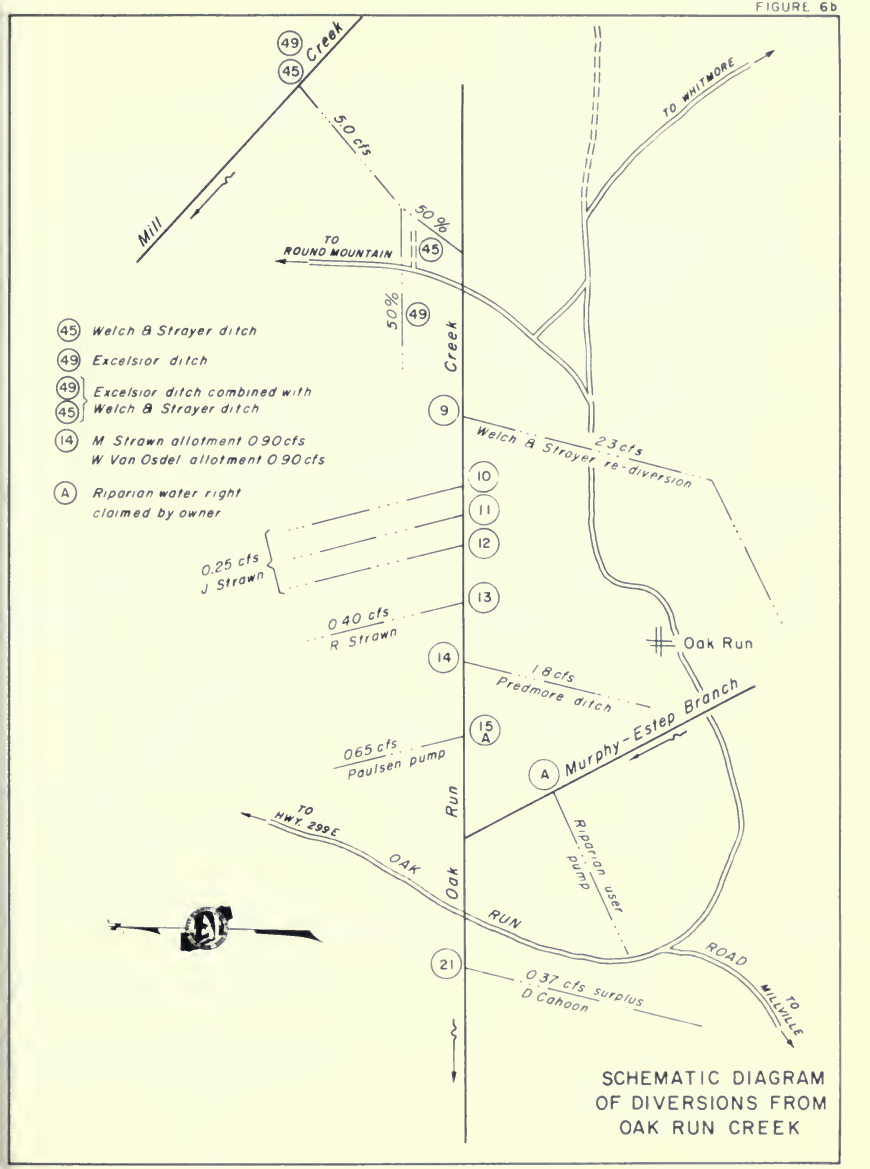
the 1968 irrigation season are: Upper North Cow Creek - two concrete control structures with metal headgates and a concrete automatic division box; Lower Cow Creek - a concrete Parshall flume; Oak Run Creek - a wooden automatic division box and improvements to several existing division boxes; Clover Creek - a concrete automatic division box.



SCHEMATIC DIAGRAM
OF COW CREEK
WATERMASTER SERVICE AREA



SCHEMATIC DIAGRAM OF DIVERSIONS FROM NORTH COW CREEK


(49) (45) Creek
5.0 cfs
Mill
50%
(45)
TO ROUND MOUNTAIN
TO WHITMORE
50%
(49)
Creek
(45) Welch & Strayer ditch
(49) Excelsior ditch
(49) (45) Excelsior ditch combined with Welch & Strayer ditch
(14) M Strawn allotment 0.90 cfs
W Van Osdel allotment 0.90 cfs
(A) Riparian water right claimed by owner
9
2.3 cfs
Welch & Strayer re-diversion
10
11
12
0.25 cfs
J Strawn
13
0.40 cfs
R Strawn
Oak Run
14
1.8 cfs
Predmore ditch
15 A
0.65 cfs
Paulsen pump
A Murphy-Estep Branch
TO HWY. 299E
OAK
Oak Run
Riparian user pump
RUN
ROAD
TO MILLVILLE
21
0.37 cfs surplus
D Canoon
SCHEMATIC DIAGRAM OF DIVERSIONS FROM OAK RUN CREEK

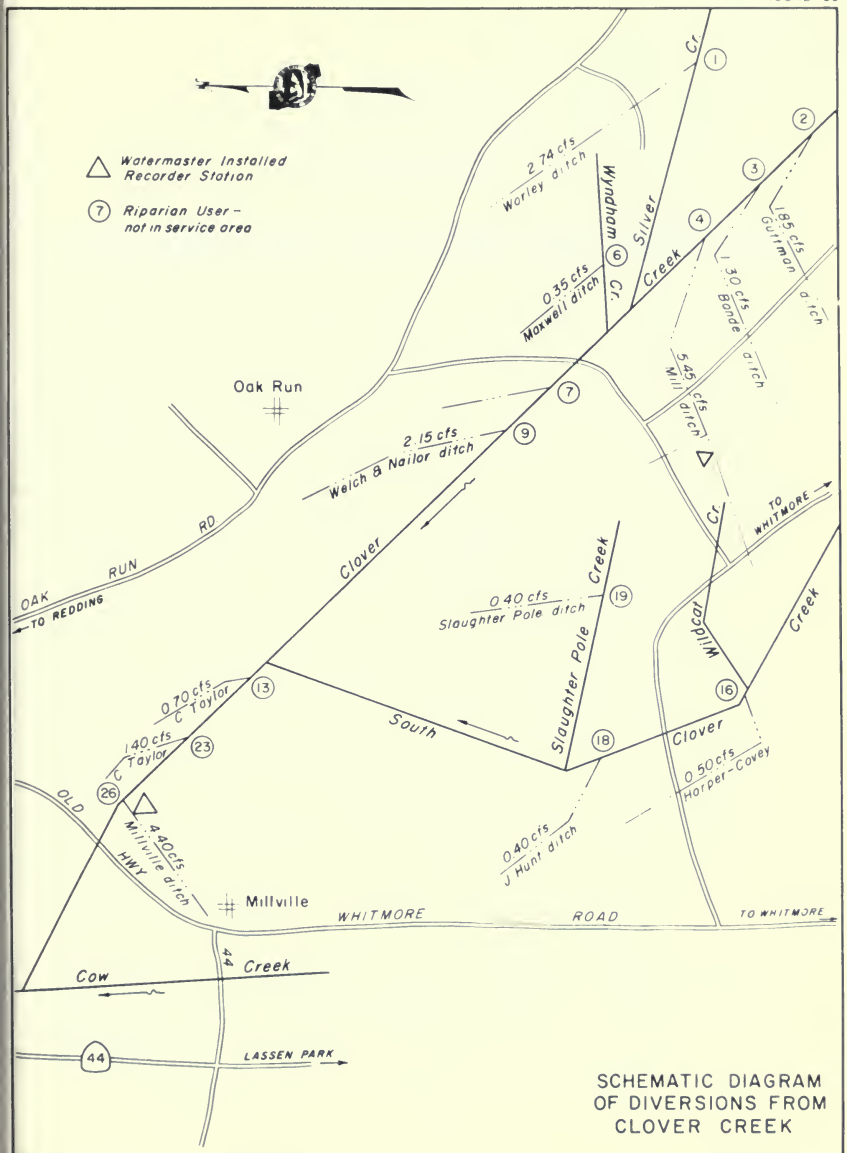

Watermaster Installed Recorder Station
7 Riparian User – not in service area
2.74 cfs Worley ditch
Wyandawyx Cr.
Silver Creek
0.35 cfs Maxwell ditch
1.85 cfs Guitmon ditch
1.30 cfs Bonde ditch
5.65 cfs Mill ditch
Oak Run
2.15 cfs Welch & Nailor ditch
Clover
OAK RUN RD
TO REDDING
Cr.
TO WHITMORE
0.40 cfs Slaughter Pole ditch
Slaughter Pole Creek
Wildcat
Creek
0.70 cfs C. Taylor
1.40 cfs Taylor
South
Clover
0.50 cfs Harper-Covey
OLD
4.40 cfs Millville ditch
HWY
Millville
WHITMORE ROAD
TO WHITMORE
0.40 cfs J Hunt ditch
Cow
44 Creek
44
LASSEN PARK
SCHEMATIC DIAGRAM OF DIVERSIONS FROM CLOVER CREEK

TABLE 12
DAILY MEAN DISCHARGE
North Cow Creek near Ingot
March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12			NO RECORD AVAILABLE				
13							
14			FOR 1967 SEASON				
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
Mean							
Runoff in acre-feet							

Digger Creek Watermaster Service Area

The Digger Creek service area is located in portions of southeastern Shasta County and northeastern Tehama County. There are 33 water right owners in the area with total allotments of 23.225 cubic feet per second.

Digger Creek forms a portion of the boundary line between Shasta County on the north and Tehama County on the south. It drains an area of approximately 45 square miles on the western slopes of mountains situated immediately west of Lassen National Park. The creek flows in a westerly direction through the town of Manton to its confluence with North Fork Battle Creek. Manton, the only community in the area, is located approximately 40 miles northeast of Red Bluff.

A schematic drawing of the Digger Creek stream system is presented as Figure 7, page 61.

Water Supply

Precipitation, occurring principally in the winter months, is typical of Northern California foothill areas. Snowmelt contributes to the early runoff but the summer streamflow is primarily from springs. In average runoff years there is sufficient flow in Digger Creek, with careful regulation, to satisfy all decreed allotments throughout the entire irrigation season. However, serious deficiencies occur in dry years.

The estimated daily mean discharge of Digger Creek below South Fork Branch is presented in Table 13, page 63.

Method of Distribution

There are four court decrees (see Table 1) on Digger Creek. These decrees, in effect, have divided the water rights on the creek into two groups: the upper users and the lower users. The three upper users irrigate lands adjoining the stream, so that all water not consumptively used returns to Digger Creek. The lower users are located within

a three-mile reach of the stream and within a five-square-mile area. Very little runoff from the lower users returns to the creek.

The three upper users' water rights are absolute and not correlative to the lower users; therefore, allotments are not cut proportionally as Digger Creek flows decrease. The lower users, whose water rights total 12 cubic feet per second, have their allotments cut proportionally as the flow decreases. In effect, the upper users have first priority allotments and the lower users have second priority allotments.

Irrigation is done principally by wild flooding, although border checks and sprinklers are used on a few fields. Small diversion dams are placed in the stream channel to divert water into ditches for conveyance to the fields.

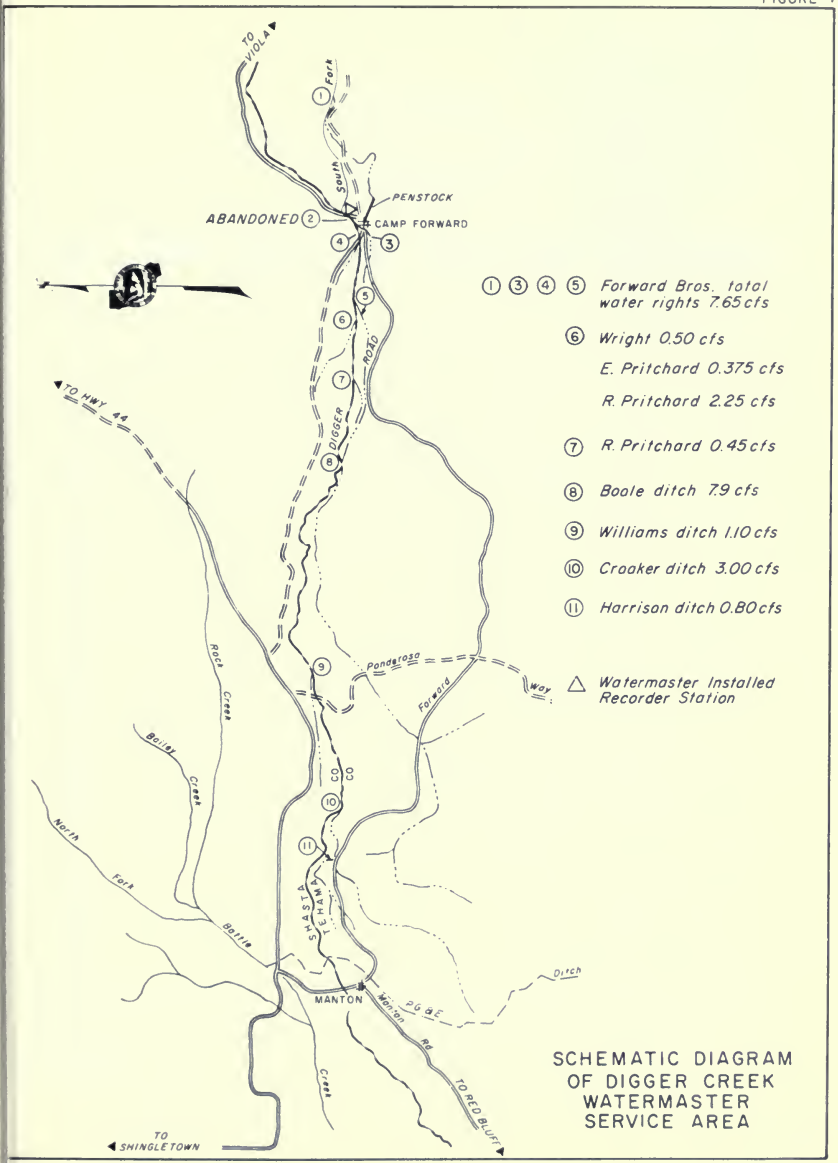
1967 Distribution

Watermaster service began July 1 in the Digger Creek service area and continued until September 30. Ross P. Rogers, Water Resources Engineering Associate, was watermaster during this period.

The available water supply in Digger Creek was outstanding. During the usually critical months of August and September all water users received 100 percent or more of their allotments. In addition, surplus quantities ranging from 10 to 25 percent of the total adjudicated water rights flowed unused from the service area.

Special Occurrences

The Harrison Ditch water rights were again diverted into the Crooker Ditch for about a quarter-mile and then rediverted to the Harrison Ditch. An agreement between the water right owners in both ditches finalizing this arrangement is expected to be signed shortly. An automatic concrete division box will then be constructed at the point of rediversion of the Harrison Ditch water.



SCHEMATIC DIAGRAM OF DIGGER CREEK WATERMASTER SERVICE AREA

TABLE 13
DAILY MEAN DISCHARGE

Digger Creek below South Fork Branch

March through September 1967
(In second-feet)
Intermittent Records Only

Day	March	April	May	June	July	August	September
1					50	32	
2							
3							
4							
5							
6							25
7							
8							
9							
10					45		
11						30	24
12							
13							
14							
15							
16							
17							25
18					40		
19							
20							
21						28	
22							
23							
24							
25							
26					36		
27							
28						26	25
29							
30							
31							
Mean							
Runoff in acre-feet							

Hat Creek Watermaster Service Area

The Hat Creek service area is located in the eastern part of Shasta County north of Lassen Volcanic National Park. There are 44 water right owners in the area with total allotments of 135.535 cubic feet per second. Hat Creek, which flows in a northerly direction through the area, is the only source of water supply in the service area. The place of use is Hat Creek Valley, which is approximately 20 miles long and two miles wide. Commencing at a point about three miles south of the town of Old Station, the valley extends northward to the confluence of Rising River and Hat Creek. The irrigable lands, which consist primarily of volcanic ash, are interlaced with large outcroppings of volcanic rock.

Schematic drawings for both the upper and lower users' diversion systems from Hat Creek are presented as Figures 8 through 8b, pages 67 through 71.

Water Supply

The water supply of Hat Creek is derived from snowmelt runoff on Mount Lassen and from large springs. Snowmelt normally creates a high flow during May and June; however, the substantial portion of supply during the summer months comes from large springs which decrease only slightly in output. Only after a series of dry years does the flow of these springs fall much below 75 percent of the total allotments.

A record of the daily mean discharge of Hat Creek near the town of Hat Creek is presented in Table 14, page 73.

Method of Distribution

The Hat Creek decree (see Table 1) divides the water rights on Hat Creek into two groups (upper users and lower users) who use the water on a 10-day rotation schedule, with one priority class for each group as the basis for distribution. This requires a complete regulation of all diversion every 10 days, alternating an irrigation supply to one group

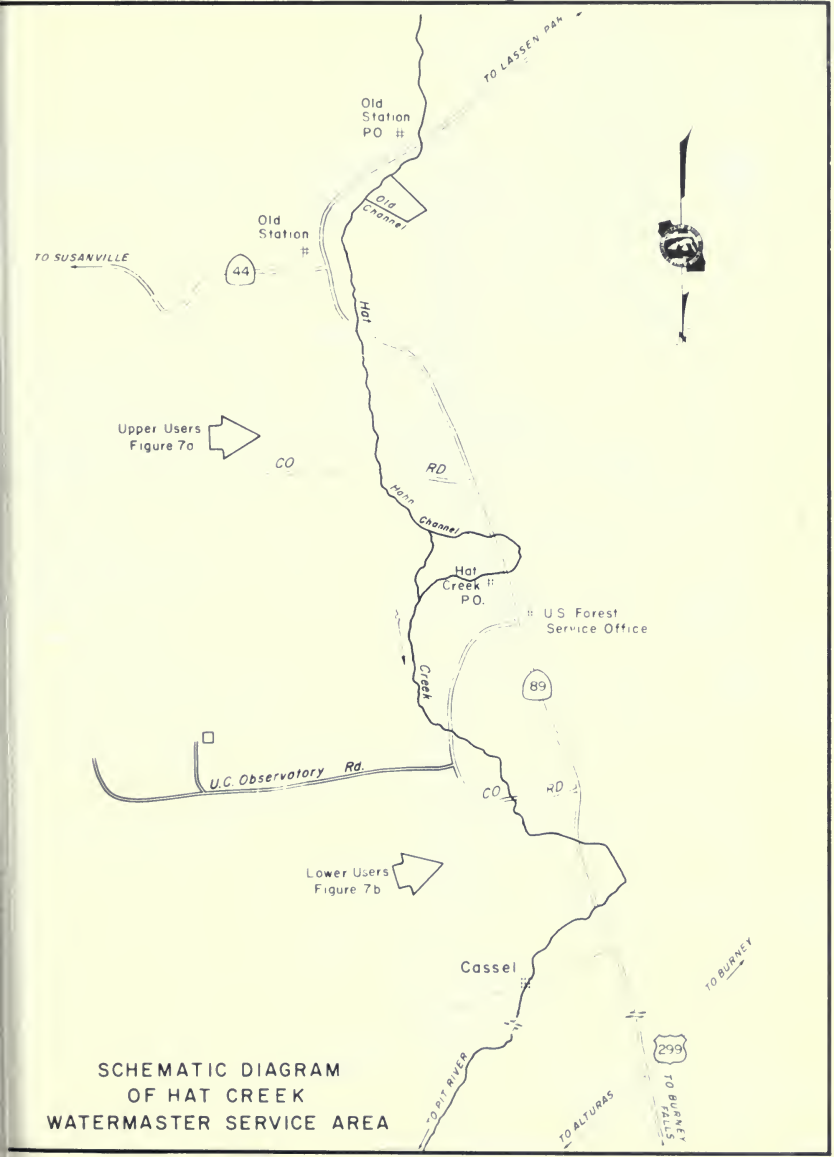
and a minimum flow (stockwater) to the other group.

Most irrigation in the area is accomplished by wild flooding. Large heads of water are used to cover the land rapidly, thereby preventing excessive loss from percolation in the extremely porous soil. Diversion dams constructed across the creek serve to divert water into large ditches. The fields, many of which have checks and borders, are then flooded from the main diversion ditch or from laterals. A few domestic rights are met by pumping directly from Hat Creek.

1967 Distribution

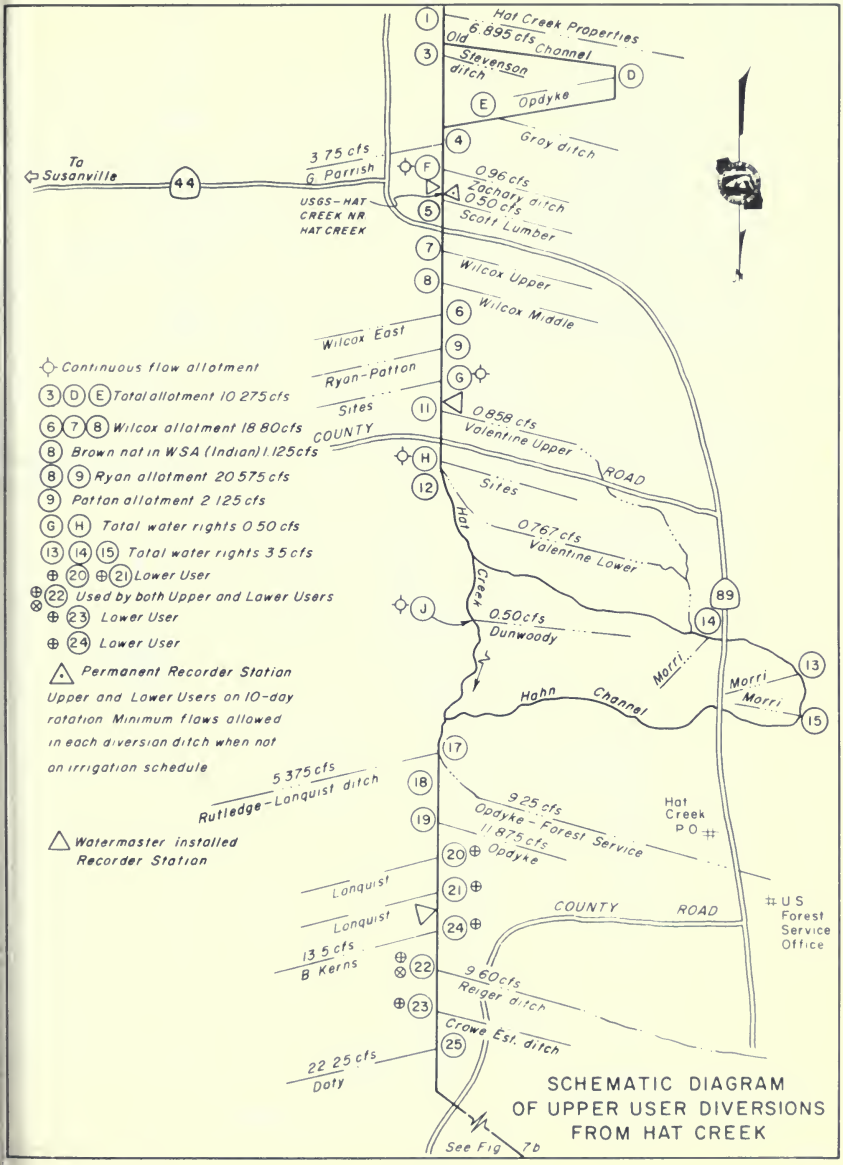
Watermaster service began May 1 in the Hat Creek service area and continued until September 30. Virgil D. Buechler, Water Resources Technician II, was watermaster during this period.

The available water supply in Hat Creek was far above average through July. Therefore, the usual 10-day rotation schedule was not put into effect until August 1. The flow then gradually decreased until by August 19, it was necessary to regulate the lower users to 80 percent of their first priority allotments. The flow then remained essentially constant for the remainder of the season.

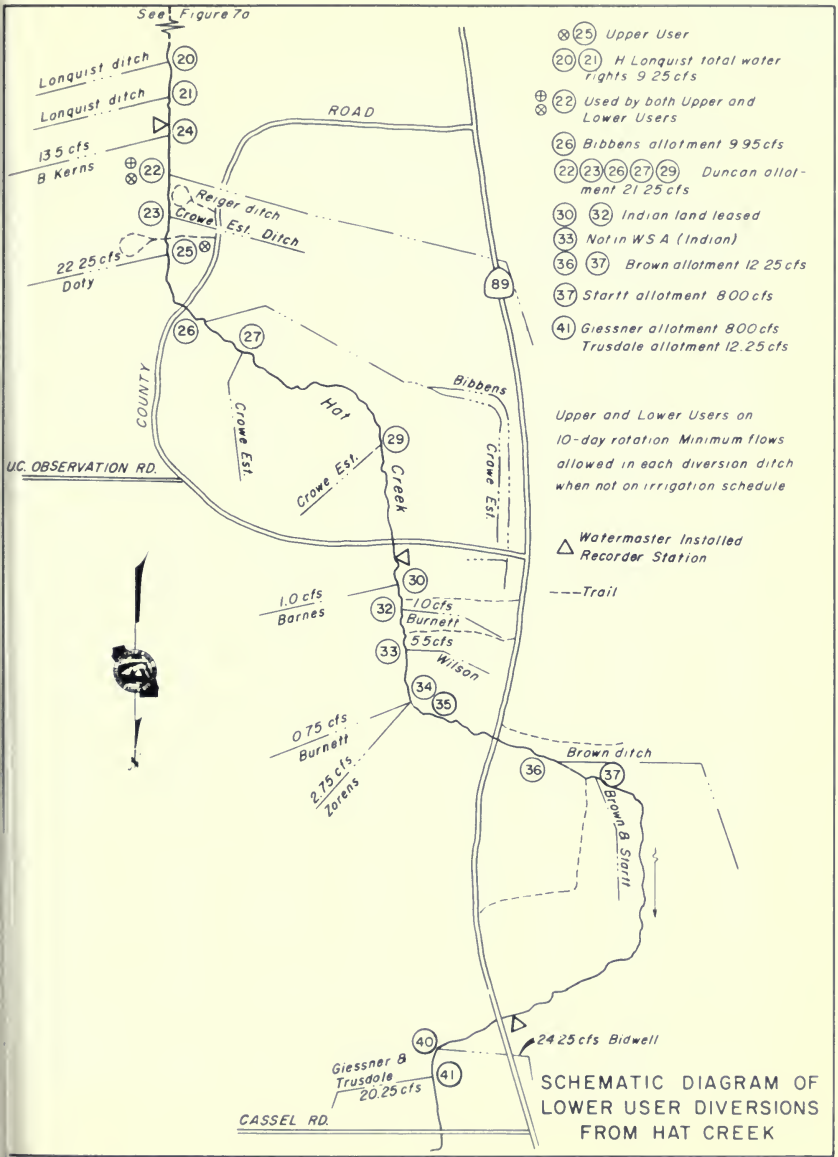


SCHEMATIC DIAGRAM
OF HAT CREEK
WATERMASTER SERVICE AREA

FIGURE 8a



SCHEMATIC DIAGRAM OF UPPER USER DIVERSIONS FROM HAT CREEK



SCHEMATIC DIAGRAM OF LOWER USER DIVERSIONS FROM HAT CREEK

TABLE 14
DAILY MEAN DISCHARGE

HAT CREEK NEAR HAT CREEK

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	133	138	153	217	[illegible]	157	128
2	133	137	135	198	300	154	127
3	134	136	135	193	[illegible]	152	127
4	132	136	137	200	281	157	128
5	133	134	137	211	73	155	128
6	133	138	137	225	270	156	128
7	133	136	143	228	96	153	124
8	133	136	154	246	255	152	132
9	134	136	167	275	244	146	132
10	133	136	159	285	3[illegible]	143	131
11	127	136	150	290	[illegible]7	142	132
12	127	135	147	300	[illegible]9	140	135
13	130	136	146	283	[illegible]7	138	135
14	130	137	150	275	[illegible]	138	135
15	132	136	157	275	[illegible]4	138	135
16	147	135	163	288	[illegible]	137	135
17	158	135	174	304	204	136	131
18	150	134	184	314	191	134	126
19	144	136	191	336	183	140	126
20	143	135	198	330	171	144	124
21	143	134	214	33[illegible]	[illegible]6	[illegible]3	124
22	143	135	230	310	175	[illegible]	123
23	144	134	[illegible]6	300	171	156	125
24	140	135	255	302	[illegible]6	158	124
25	141	132	244	310	164	148	124
26	140	134	246	310	15[illegible]	141	[illegible]4
27	140	135	246	306	15[illegible]	140	123
28	141	132	255	306	158	138	128
29	140	133	256	304	[illegible]	[illegible]	132
30	138	132	247	304	154	131	134
31	137		240		152	128	
Mean	138	135	186	278	[illegible]	[illegible]	[illegible]
Runoff in acre-feet	8460	8050	11450	16570	13050	8700	7650

Indian Creek Watermaster Service Area

The Indian Creek service area is located in the north central part of Plumas County in the vicinity of the town of Greenville. There are 43 water right owners in the service area with total allotments of 97.015 cubic feet per second. The major sources of supply in the service area are Indian Creek and two major tributaries, Wolf Creek and Lights Creek. Indian Creek and its minor tributaries rises in the mountains east of the service area. It then flows through Gennessee Valley and through Indian Valley past the towns of Taylorsville and Crescent Mills to its confluence with the North Fork Feather River. Indian Creek is joined from the north by Lights Creek and Wolf Creek in the northwest part of the valley. The major place of use is in Indian Valley, which is about four miles long and two and one-half miles wide. The average elevation is about 3,500 feet.

A schematic drawing of each major stream system within the Indian Creek service area is presented as Figures 9 through 9c, pages 77 through 83.

Water Supply

The water supply in the Indian Creek service area is derived primarily from snowmelt runoff with springs and seepage maintaining some late summer flow. The flow of Wolf Creek is normally sufficient to supply all allotments until June 1, while Indian and Lights Creeks, with the exception of some tributaries, have sufficient flow to supply all allotments until July 1. After these dates, the flow steadily decreases throughout the season until by the end of August only a small portion of allotments is available.

A record of the daily mean discharge of Indian Creek near Taylorsville is presented in Table 15, page 85.

Method of Distribution

The basic method of irrigation in Indian Valley is wild flooding.

Small diversion dams are placed in the stream channels to divert the water into distribution ditches for conveyance to the fields. Small check dams, located throughout the fields in swales, help to spread the water over the ground. There is a limited amount of check and border irrigation in the valley. A few sprinkling systems are also in use.

The Indian Creek decree (see Table 1) establishes three priority classes for each of the major stream systems within the Indian Creek service area.

1967 Distribution

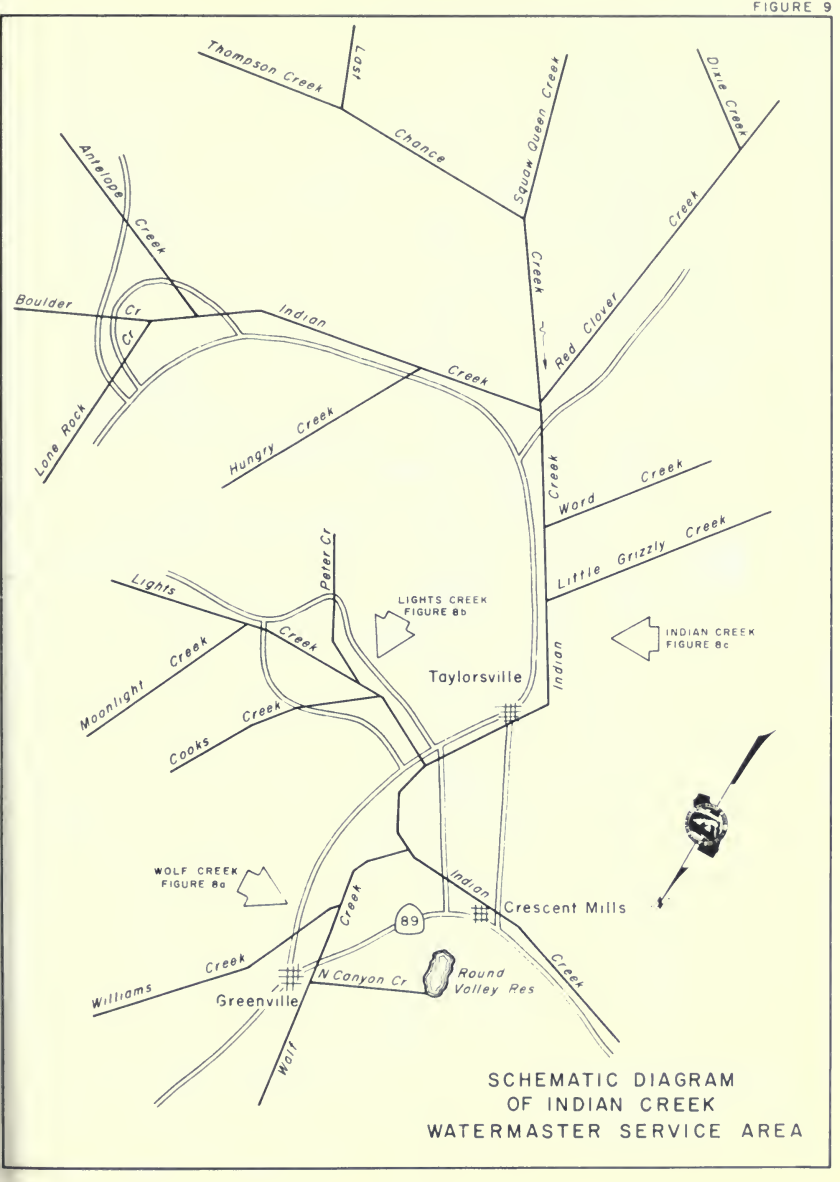
Watermaster service began in the Indian Creek service area on April 27 and continued until September 30. Harvey M. Jorgensen, Water Resources Engineering Associate, was the watermaster during this period.

An above-average water supply existed in the service area during the 1967 season.

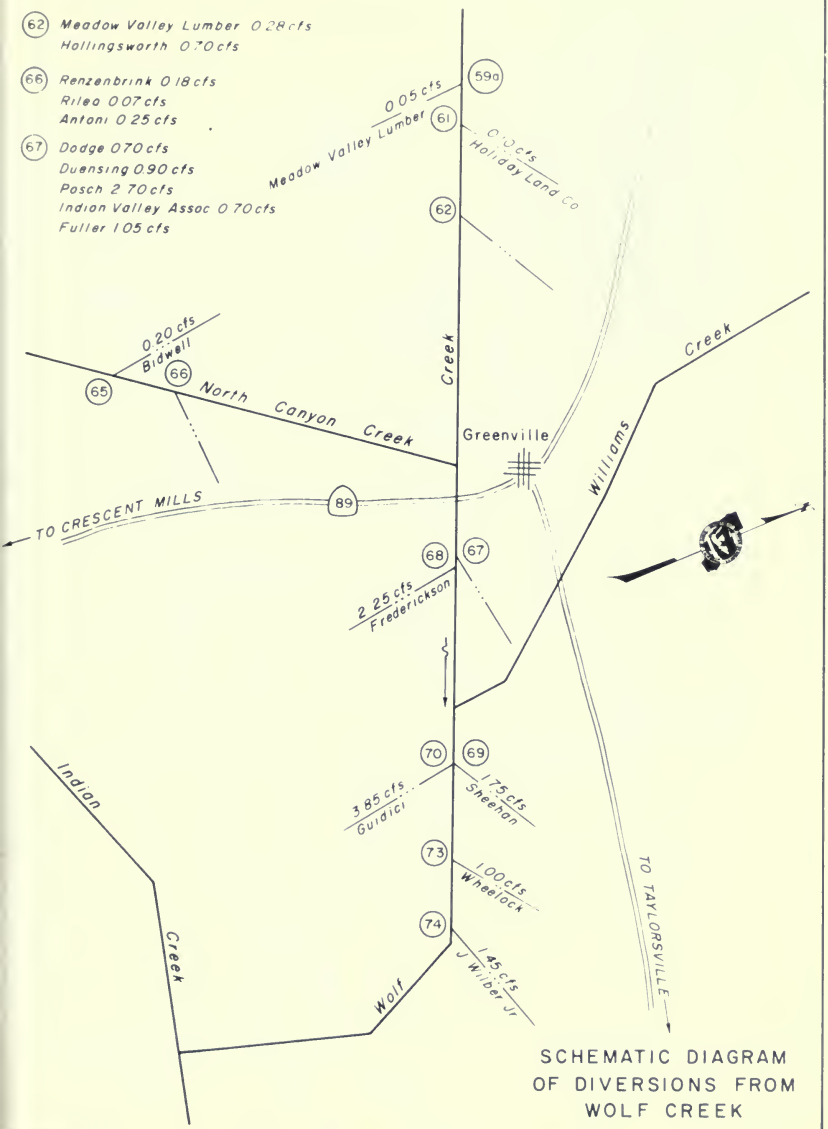
Wolf Creek. The available water supply of Wolf Creek was sufficient to satisfy all allotments (three priorities) until August 15. This supply was quite unusual. Some of the diversion ditches had to be turned off during the season due to over wetting of pastures.

Lights Creek and Tributaries. The water supply of Lights Creek was sufficient to satisfy all allotments (three priorities) until August 1. Flow in both Lights Creek and Cooks Creek remained above normal throughout the season. On August 14 there was two cubic feet per second in Lights Creek and one-half cubic foot per second in Cooks Creek. These observations were made at the county road bridge crossings. The creeks are normally dry in these reaches near the end of June.

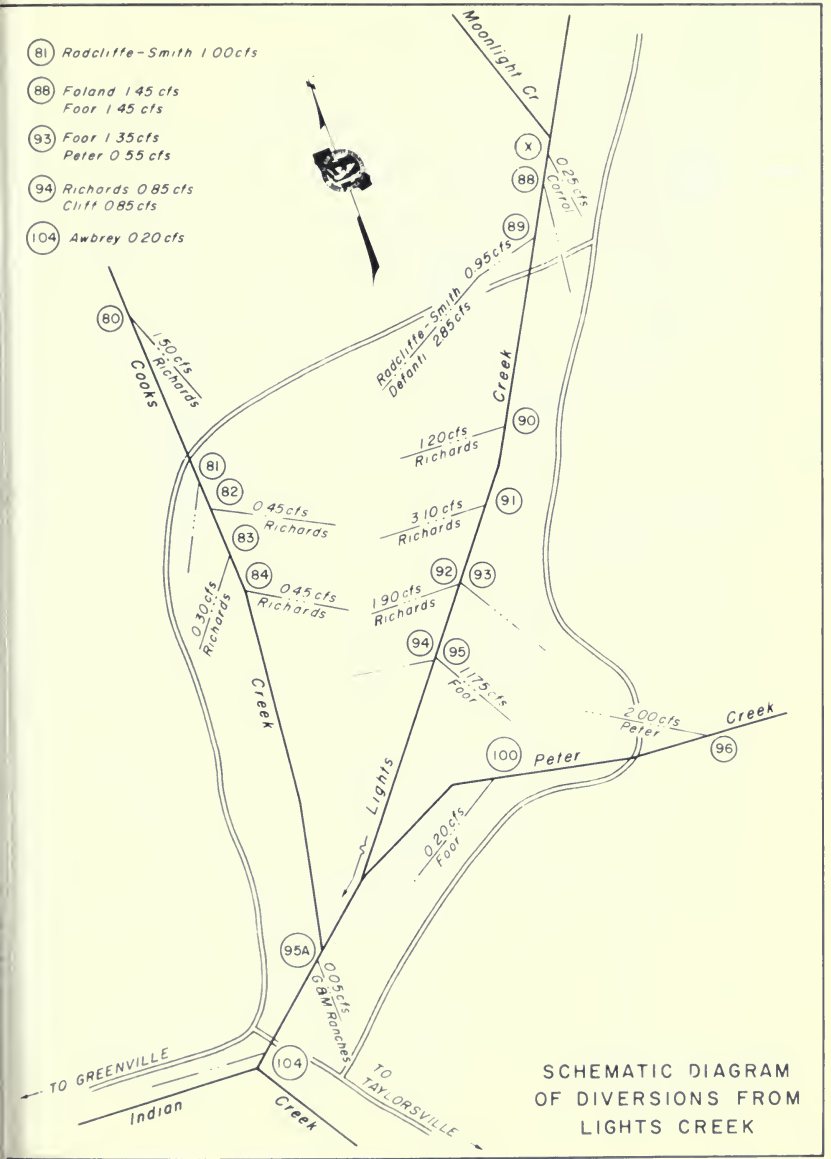
Indian Creek. The available water supply in Indian Creek was sufficient to satisfy all allotments (three priorities) until August 1. On July 24 there was 20 cubic feet per second passing diversion 54, a normally dry reach at that time.



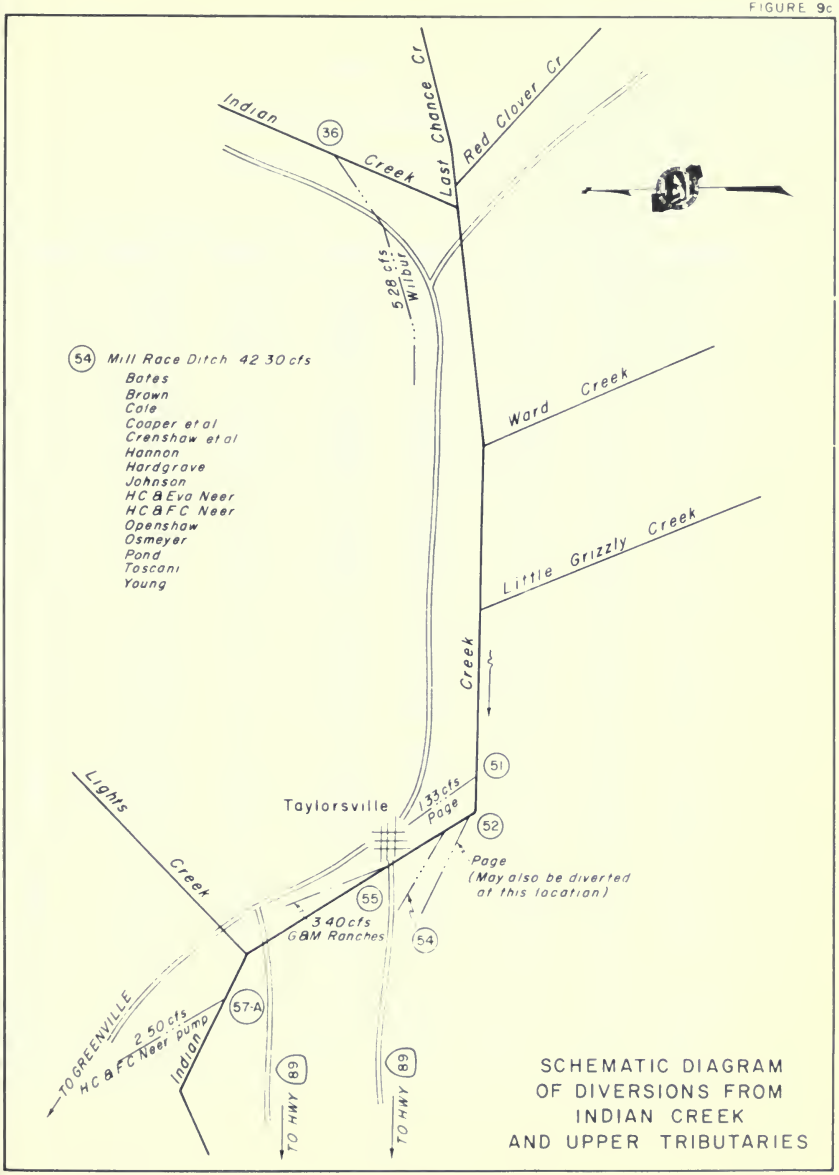
SCHEMATIC DIAGRAM
OF INDIAN CREEK
WATERMASTER SERVICE AREA



SCHEMATIC DIAGRAM OF DIVERSIONS FROM WOLF CREEK



SCHEMATIC DIAGRAM OF DIVERSIONS FROM LIGHTS CREEK



SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
INDIAN CREEK
AND UPPER TRIBUTARIES

TABLE 15

DAILY MEAN DISCHARGE
INDIAN CREEK NEAR TAYLORSVILLE

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	478	839	549	1650	443	100	57
2	530	745	662	1550	408	96	56
3	548	735	810	1610	375	93	56
4	471	749	1040	1650	337	90	59
5	431	682	1220	1810	307	82	64
6	416	660	1290	2080	286	79	62
7	430	674	1760	1770	267	77	60
8	453	709	2400	1730	252	77	58
9	519	879	3060	1720	236	75	56
10	647	981	2870	1810	219	73	56
11	546	847	2230	1620	213	71	54
12	495	751	1970	1750	201	70	54
13	459	895	1820	1960	191	69	56
14	478	1000	1840	1610	180	66	54
15	459	893	2130	1480	171	66	53
16	2350	763	2590	1400	180	63	53
17	4940	775	3090	1350	242	62	56
18	3420	810	3470	1310	201	61	62
19	2290	812	3440	1250	174	64	61
20	1820	692	3490	1210	159	59	61
21	1810	685	3650	1090	153	58	57
22	1920	650	3720	971	147	57	58
23	2040	613	3480	866	140	56	59
24	1800	630	3270	789	133	57	57
25	1540	624	2810	738	126	59	56
26	1310	593	2460	675	115	63	56
27	1150	615	2290	616	110	60	55
28	1260	608	2110	567	107	60	53
29	1110	584	1910	527	105	59	54
30	1000	555	1720	485	101	58	55
31	920		1670		100	58	
Mean	1227	735	2285	1321	206	69.0	56.9
Runoff in acre-feet	75450	43730	140500	78630	12650	4241	3388

Middle Fork Feather River Watermaster Service Area

The Middle Fork Feather River service area is located in the plateau area on the west slope of the Sierra Nevada in the eastern portions of Sierra and Plumas Counties. There are 96 water right owners with total allotments of 370.865 cubic feet per second.

Major sources of supply for this service area are the Middle Fork Feather River and its tributaries in Sierra Valley. The area is comprised of five major stream groups. These groups, starting in the north and east corner of the valley and proceeding in a southerly and westerly direction, are Little Last Chance Creek, Smithneck Creek, Webber Creek and tributaries, West Side Canal, and Fletcher Creek. The Middle Fork Feather River channel flows in a general northerly direction for approximately 20 miles through Sierra Valley. It then flows in a westerly direction. The major place of use is in Sierra Valley, which is about 15 miles long and 10 miles wide. The average elevation of the valley floor is 4,900 feet.

A schematic drawing of the Middle Fork Feather River service area is presented as Figure 10, page 91.

Water Supply

The major water supply in the Middle Fork Feather River service area is derived from snowmelt runoff, with minor flow from springs and from supplemental stored and foreign water.

Natural flows of Little Last Chance Creek are supplemented by reservoir storage provided by Frenchman Dam which was constructed by the Department of Water Resources in 1961. Stored water is released and used as needed under the provisions of an annual contract. Smithneck Creek flow is normally sufficient to supply all allotments until about the middle of May. It then decreases rapidly until about June 1. Only first and second priority allotments are then available for the remainder of the season.

The natural flow of Webber Creek is normally sufficient to supply all allotments until the middle of May. At that time up to 60 cubic feet per second is diverted from Little Truckee River to supplement the flow. This imported water is diverted through the Little Truckee Ditch into Cold Stream and then into Webber Creek for use by shareholders in the Sierra Valley Water Company. This supplemental supply decreases rapidly during July, producing only a small quantity during the latter part of the season. The West Side Canal streams normally supply all allotments until the first part of June. The flow then gradually declines throughout the season.

The flow of Fletcher Creek and Spring Channels normally supplies all allotments until July 1. The flow then gradually declines for the remainder of the season.

Records of the daily mean discharge of several stream gaging stations in the Middle Fork Feather River service area are presented in Tables 16 through 19, pages 93 through 96.

Method of Distribution

Wild flooding is employed by the majority of the water users to irrigate their fields. Small diversion dams are placed in the stream channels to divert the water into individual distribution systems. Check dams are constructed in the swales to implement flooding once the water reaches the fields.

The Middle Fork Feather River decree (see Table 1) establishes the number of priority classes for each of the major stream systems within the Middle Fork Feather River service area as follows: Little Last Chance Creek - five; West Side Canal Group - five; Fletcher Creek and Spring Channels - three; Sierra Valley Mutual Water Company - one; Webber Creek and tributaries - six; and Smithneck Creek - five.

1967 Distribution

Watermaster service began April 1 in the Middle Fork Feather River service area and continued until September 30. Joe Nessler, Water Resources Engineering Associate, was watermaster during this

period. He was assisted by Conrad Lahr, Water Resources Technician II.

An above-average water supply existed in the service area during the 1967 season.

Little Last Chance Creek. Frenchman Dam and Reservoir began its sixth season of operation in 1967. Agreements concerning storage and distribution were again negotiated with the users in this stream system. The resulting changes in procedures and specific details of distribution and operation are covered in a separate report prepared by the Operations Section of the Sacramento District.

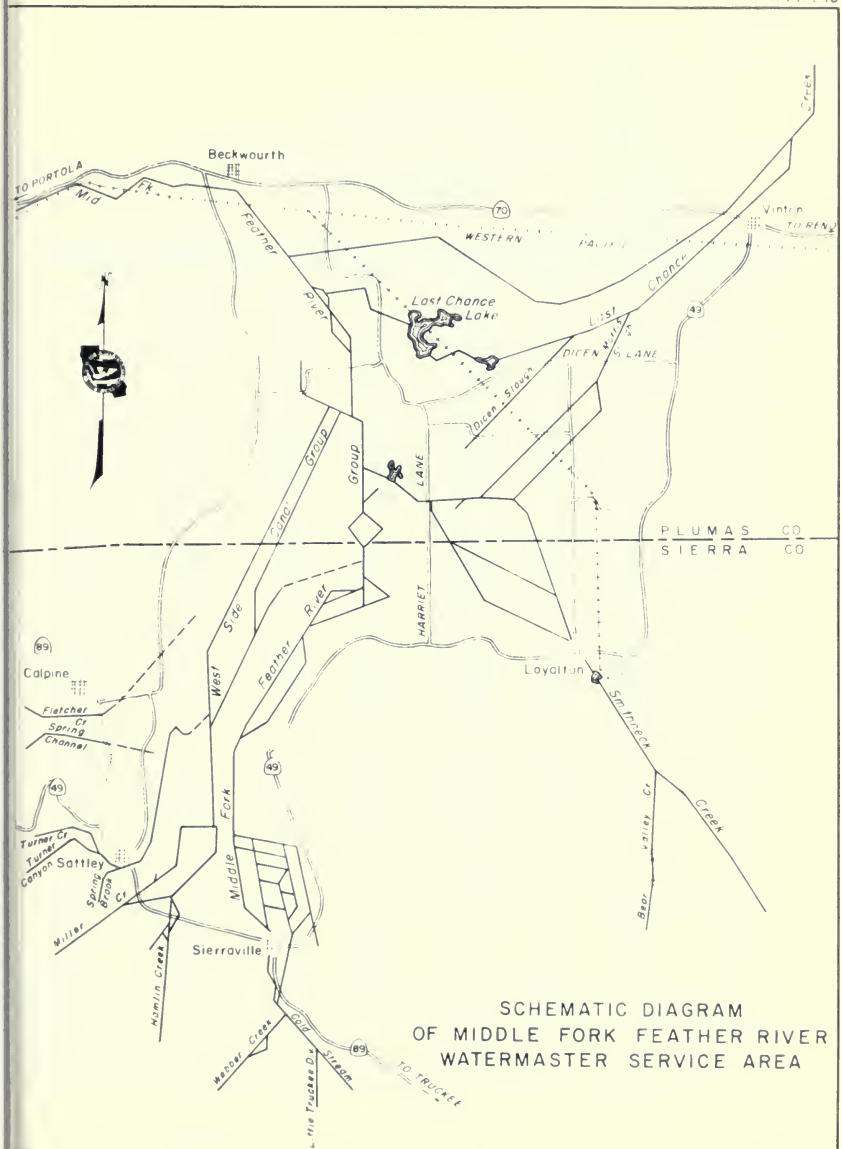
West Side Canal Group. The West Side Canal Group, consisting of Hamlin, Miller, and Turner Creeks, received a sufficient water supply to satisfy all allotments (five priorities) until about August 1. Throughout the remainder of the season the supply was enough to meet demands.

Fletcher Creek and Spring Channels. The available water supply was sufficient to satisfy all allotments (three priorities) throughout the season.

Sierra Valley Mutual Water Company. The Little Truckee Ditch conveyed 2,314 acre-feet of water to the Sierra Valley Mutual Water Company from July 7 through September 30, 1967. Water was distributed to shareholders in accordance with schedule 9 of the Middle Fork Feather River decree.

Webber Creek and Tributaries. The natural flow of Webber Creek was sufficient to supply all allotments (six priorities) until July 1. Combined with the water imported from the Little Truckee River, beginning July 7, the total supply was sufficient to satisfy all allotments of the Sierra Valley Mutual Water Company shareholders until August 1. The natural flow then decreased gradually so that only first and second priority allotments were being served at the end of the season.

Smithneck Creek. The available water supply on Smithneck Creek was sufficient to satisfy all allotments (five priorities) until June 1. Although the flow slowly receded, all demands continued to be met until haying time. Irrigation requirements then dropped sharply. Stockwater was available throughout the remainder of the season. The usual practice of rotation of water rights was not necessary.



SCHEMATIC DIAGRAM
OF MIDDLE FORK FEATHER RIVER
WATERMASTER SERVICE AREA

TABLE 16
DAILY MEAN DISCHARGE

Little Last Chance Creek near Chilcoot

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	Septembe-
1	4.5	5.2	62	283	52	44	63
2	4.8	4.5	65	259	46	50	52
3	4.8	4.5	75	239	40	60	50
4	4.3	4.3	90	223	34	62	50
5	4.1	4.3	116	216	30	65	35
6	4.1	4.3	130	213	27	81	25
7	4.1	4.5	159	206	24	93	24
8	4.1	4.8	205	198	22	95	24
9	4.8	5.5	264	196	19	124	24
10	5.2	5.8	298	198	18	124	25
11	4.8	6.2	291	193	16	124	25
12	5.5	6.2	288	216	18	121	25
13	5.5	6.9	267	244	16	121	25
14	4.1	7.7	257	235	21	121	25
15	4.0	7.3	271	223	25	121	25
16	24	6.9	298	211	31	121	31
17	22	7.3	363	196	35	121	41
18	15	7.3	413	183	32	121	41
19	12	7.7	453	172	32	121	31
20	11	12	476	164	35	90	25
21	11	20	490	152	35	62	25
22	10	28	514	136	35	69	15
23	10	35	524	124	35	75	8.2
24	9.1	43	509	108	35	90	8.2
25	8.2	47	481	95	35	102	8.6
26	7.3	50	444	86	35	102	6.2
27	6.9	56	409	77	35	102	4.3
28	6.9	58	379	69	37	102	4.3
29	6.5	60	343	63	39	86	4.3
30	5.8	62	308	56	43	77	4.3
31	5.5		292		44	77	
Mean	7.7	19.4	308	174	31.6	94.3	25.1
Runoff in acre-feet	476	1150	18910	10380	1950	5800	1500

TABLE 17
DAILY MEAN DISCHARGE
LITTLE TRUCKEE DITCH AT HEAD
March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1						37	11
2						37	11
3						36	10
4						34	14
5						29	13
6						26	11
7					5.7*	24	10
8					8.6	21	9.2
9					8.2	20	8.9
10					7.9	18	8.6
11					7.9	17	8.2
12					7.9	16	8.2
13					7.9	14	7.9
14					7.6	13	7.6
15					7.6	17	7.3
16					7.3	21	7.0
17					7.0	20	7.3
18					7.0	20	13
19					6.7	19	6.5
20					6.5	18	1.6
21					6.2	16	1.5
22					6.2	15	1.5
23					6.2	15	1.5
24					8.2	16	1.5
25					12	19	1.5
26					12	26	1.4
27					29	18	1.4
28					38	16	1.4
29					38	14	1.4
30					38	13	1.4**
31					38	12	
Mean					13.4	20.5	6.5
Runoff in acre-feet					665	1261	388

* Beginning of record
** End of record

TABLE 18
DAILY MEAN DISCHARGE

Middle Fork Feather River near Portola

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	344	563	313	1240	258	30	21
2	359	504	306	1310	235	28	18
3	334	448	293	1260	215	26	13
4	268	396	283	1100	194	25	13
5	255	366	293	996	173	21	13
6	249	337	334	890	157	18	12
7	240	355	385	785	146	17	11
8	235	381	428	757	139	14	10
9	229	366	504	692	128	13	10
10	229	327	671	656	118	12	14
11	210	296	983	596	112	9.5	18
12	170	296	1210	606	107	8.6	18
13	120	290	1090	730	101	8.1	18
14	130	293	927	813	91	9.0	18
15	200	283	808	884	82	9.0	18
16	660	280	774	854	81	8.6	18
17	2880	280	837	802	72	8.6	18
18	8750	310	878	697	66	8.1	22
19	5780	373	1020	611	60	8.6	24
20	3050	420	1170	553	56	10	32
21	1970	396	1290	499	58	13	31
22	1530	408	1360	478	54	17	29
23	1260	385	1420	448	52	22	29
24	1140	370	1490	412	50	24	32
25	1020	381	1550	404	48	23	40
26	825	370	1500	400	45	17	36
27	697	337	1420	377	42	12	35
28	631	341	1270	344	38	10	40
29	572	348	1120	303	36	13	36
30	606	341	1040	274	34	16	29
31	596		1090		32	18	
Mean	1146	361	905	692	99.4	15.4	22.5
Runoff in acre-feet	70490	21500	55650	41200	6110	946	1340

TABLE 19
DAILY MEAN DISCHARGE

Miller Creek near Sattley

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	6.5	7.8	7.5	40	94	29	10
2	6.5	7.8	7.8	37	92	27	10
3	6.5	7.5	8.0	39	87	26	10
4	6.3	7.2	8.8	42	82	24	12
5	6.0	7.5	8.6	50	77	22	11
6	5.5	7.2	9.1	52	72	21	10
7	5.5	7.8	13	57	67	20	9.6
8	5.8	7.8	18	60	64	18	9.4
9	5.8	7.5	23	62	61	17	9.4
10	5.8	7.5	19	65	57	16	9.1
11	6.0	7.2	14	66	54	16	8.8
12	13	7.2	13	76	52	15	8.8
13	31	7.2	13	72	49	15	8.6
14	21	7.5	17	70	47	14	8.6
15	5.8	7.5	23	75	45	14	8.3
16	35	7.2	30	80	45	14	8.3
17	39	7.2	36	85	43	13	8.6
18	20	7.2	40	90	41	13	12
19	15	7.2	43	90	40	13	9.4
20	12	7.0	50	90	38	12	8.6
21	11	7.2	61	90	38	12	8.0
22	11	7.2	63	90	36	12	7.8
23	11	7.2	67	90	35	12	7.8
24	9.9	7.2	71	90	34	12	7.8
25	9.6	7.2	67	95	34	14	7.8
26	9.1	7.2	68	95	33	14	7.2
27	8.8	7.2	70	95	32	12	7.2
28	8.6	7.2	69	96	32	12	7.2
29	8.3	7.2	66	94	31	11	7.2
30	8.0	7.2	59	97	31	11	7.2
31	7.8		50		30	11	
Mean	11.6	7.2	35.9	74.3	50.7	15.9	8.9
Runoff in acre-feet	716	431	2210	4420	3120	976	527

North Fork Cottonwood Creek Watermaster Service Area

The North Fork Cottonwood Creek service area is located in the southwestern part of Shasta County near the towns of Ono and Gas Point. There are nine water right owners in the area with total allotments of 30.30 cubic feet per second.

North Fork Cottonwood Creek and its tributaries, Moon Creek and Jerusalem Creek, are the major sources of water supply in the area. These creeks rise on the east slopes of the foothills of the Coast Range Mountains. North Fork Cottonwood Creek flows in a southeasterly direction to its confluence with Cottonwood Creek near Gas Point. The area is characterized by high summer temperatures and moderate rainfall. The irrigable land consists of sparsely scattered parcels separated by steep, brushy hills. These lands are at about the 1,000-foot elevation.

A schematic drawing of the North Fork Cottonwood Creek stream system is presented as Figure 11, page 99.

Water Supply

Snowmelt contributes to the flow in North Fork Cottonwood Creek during the early weeks of the irrigation season. However, perennial springs provide the major source of supply during the summer and fall months. The flow is normally sufficient to supply all demands.

A record of the daily mean discharge of North Fork Cottonwood Creek near Igo is presented in Table 20, page 101. This stream gaging station is located downstream from most points of diversion on the creek but gives a general indication of the water supply.

Method of Distribution

The general practice throughout the area is to irrigate by wild flooding. One water user, however, pumps directly from the creek using a sprinkler system to irrigate his crops. Pumping was necessary at this diversion point because the irrigated land was higher in elevation

than the creek channel.

The North Fork Cottonwood Creek decree (see Table 1) provides for distribution of water on an equal and correlative basis for all users - one priority class.

1967 Distribution

Watermaster service began July 1 in the North Fork Cottonwood Creek service area and continued until September 30. Ross P. Rogers, Water Resources Engineering Associate, was watermaster during this period.

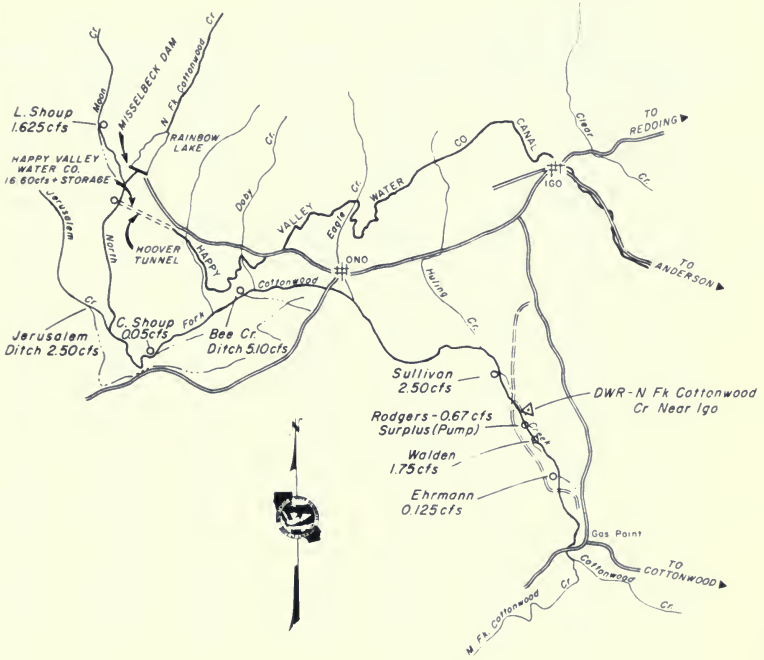
The available water supply in North Fork Cottonwood Creek was outstanding. The stream gaging station near Igo recorded a total of 59,170 acre-feet of runoff between April 1 and September 30. This is approximately 190 percent of the mean for an eleven year period of record.

All demands were met and surplus flows existed throughout the season. Several water right owners, however, did not use any of their allotments.

Special Occurrences

Missellbeck Dam was declared unsafe by the Department of Water Resources' Division of Dam Safety. Therefore, an order was issued to hold the elevation of the lake just above that of the outlet pipes. This may result in some water shortages and distribution problems until satisfactory repairs are made and the reservoir is again allowed to fill.

At the request of a water right owner on Duckett Creek (an area excluded from watermaster service in 1940), a review of the adjudicated water rights was made. This study showed that during critical low-flow periods in August and September, the two existing water rights are essentially independent of each other. Therefore, the area will continue to be excluded from the watermaster service area.



△ Permanent Recorder Station

SCHEMATIC DIAGRAM
OF N. FK. COTTONWOOD CR.
WATERMASTER SERVICE AREA

TABLE 20
DAILY MEAN DISCHARGE
NORTH FORK COTTONWOOD CREEK NEAR IGO
March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	168	382	266	284	69	20	7.3
2	165	294	262	289	66	20	7.9
3	156	280	262	242	66	20	7.9
4	152	289	266	219	64	20	7.9
5	149	349	271	219	61	18	9.2
6	140	926	276	204	61	18	9.8
7	135	753	321	196	59	18	10
8	129	593	397	185	52	16	9.8
9	124	599	588	175	49	16	10
10	200	676	476	165	47	16	10
11	215	849	392	149	45	16	11
12	219	683	354	159	45	14	10
13	196	582	321	140	42	14	9.2
14	193	492	307	126	42	14	9.2
15	196	460	316	92	38	12	8.5
16	571	438	335	83	40	12	7.9
17	369	664	335	80	38	12	10
18	294	498	316	78	37	12	13
19	266	476	303	78	37	10	12
20	423	454	296	106	35	9.4	10
21	373	412	294	101	35	9.2	9.2
22	335	423	280	95	33	9.2	9.2
23	326	465	276	95	33	9.2	9.2
24	303	382	266	92	33	9.2	9.2
25	284	349	253	87	33	9.2	9.2
26	266	330	242	86	25	8.5	9.2
27	249	358	234	83	22	7.9	9.2
28	245	316	226	80	22	7.3	8.5
29	242	284	226	75	22	6.9	7.9
30	335	271	219	72	22	7.3	8.5
31	402		215		20	7.3	
Mean	252	478	303	138	41.7	12.9	9.3
Runoff in acre-feet	15510	28420	18630	8210	2560	791	555

North Fork Pit River Watermaster Service Area

The North Fork Pit River service area lies along the west slopes of the Warner Mountains in northeastern Modoc County and extends from the Oregon border about 45 miles southward to a point just below Alturas. There are 95 water right owners in the area with total allotments of 215.065 cubic feet per second.

A number of small independent stream systems, rising on the west slope of the Warner Mountains and generally following a westerly direction, comprise the major source of water supply. Three of these streams, New Pine Creek, Cottonwood Creek, and Davis Creek, are tributary to Goose Lake. The other streams in the service area are all tributary to the North Fork Pit River. They are: Linville Creek, Franklin Creek, Joseph Creek, Thoms Creek, and Parker Creek. Shields Creek and Gleason Creek are tributaries to Parker Creek. The North Fork Pit River flows in a general southerly course from the south rim of Goose Lake to the confluence with the South Fork Pit River immediately below Alturas. The streams tributary to Goose Lake do not contribute to the flow of the North Fork Pit River since the lake has not spilled into the river for nearly 100 years.

The place of use in the northern half of the area lies in a relatively long, narrow, sloping strip extending between the eastern shore of Goose Lake and the foothills of the Warner Mountains. The places of use in the southern half of the area, consisting of the North Fork Pit River and its tributaries, are primarily in the narrow valleys bordering the streams.

A schematic drawing of each major stream system within the North Fork Pit River service area is presented as Figures 12 through 12k, Pages 109 through 131.

Water Supply

The streams which serve the area are fed by snowmelt runoff and

springs in the Warner Mountains. A large portion of the runoff occurs early in the spring, decreasing rapidly in May and June. The watershed of New Pine Creek, however, is at a higher elevation and maintains a good supply well into the summer. After the snowpack is depleted, perennial springs at the headwaters of the tributaries are the main sources of water supply. Linville Creek, with its small drainage basin, depends almost entirely on the springs at its head. Gleason Creek, Thoms Creek, and Cottonwood Creek are usually dry in August, except during years of above-average water supply.

Some supplemental water is stored in small reservoirs throughout the area, none of which are operated by the watermaster. However, the inflows to some of these reservoirs are under the watermaster's jurisdiction.

Records of the daily mean discharge at several stream gaging stations in the North Fork Pit River service area are presented in Tables 21 through 32, pages 133 through 144.

Methods of Distribution

Irrigation is accomplished primarily by wild flooding from random field ditches along high spots in the meadows. Various types of diversion structures are used to divert the natural streamflow into small earth ditches which convey it to the meadows. At present there is a limited amount of sprinkler irrigation, some by naturally developed pressure and some by direct pumping from small sumps in the ditches. Subirrigation by the use of large flashboard dams to raise the water level in the stream channel is being practiced on the North Fork Pit River between Parker Creek and Alturas.

The several decrees (see Table 1) which apply to the North Fork Pit River service area establish the following number of priority classes for the various stream systems: New Pine Creek - four; Cottonwood Creek - six; Davis Creek - four; Linville Creek - two; Franklin Creek - four; Joseph Creek - four; Thoms Creek - three; Parker Creek - four; Shields Creek - four; Gleason Creek - five; and North Fork Pit River - five.

1967 Distribution

Watermaster service began April 20 in the North Fork Pit River service area and continued until September 30. Charles H. Holmes Assistant Civil Engineer, was watermaster during this period.

The available water supply during the spring months was excellent throughout the service area. Because of a very warm summer, however, streamflows during the latter part of the season were at or near average conditions.

New Pine Creek. Surplus water was available to New Pine Creek water right owners throughout the period that the proration or correlative system of distribution was in effect (until June 30). Commencing July 1, in accordance with provisions of the decree, distribution was based on the priority system (four priorities). Fourth priority allotments received some water until July 23. All third priority allotments were satisfied until August 7. Thereafter, the flow gradually decreased until approximately 70 percent of second priority allotments were being met at the end of the season.

Cottonwood Creek. A sufficient water supply existed in Cottonwood Creek to satisfy all allotments (six priorities) until late spring. The fourth priority allotments were served until late June. Thereafter, the flow decreased gradually, reaching first priority on August 1. By the end of the season the flow had decreased until only about 15 percent of first priority allotments were served.

Davis Creek. The available water supply in Davis Creek was sufficient to satisfy all allotments (four priorities) until June 2. One hundred percent of third priority allotments were served until June 22. The flow then steadily decreased, reaching 100 percent of the second priority allotments on September 1. At the end of the season the flow had receded slightly to 80 percent of first priority allotments.

Linville Creek. The available water supply in Linville Creek decreased steadily from the time watermaster service began until the end of the irrigation season. A small percentage of second priority allotments (two priorities) was supplied from May 18 to May 24. The available supply for first priority allotments ranged between 100 percent

on May 25 to 60 percent at the end of the season.

Franklin Creek. The available water supply in Franklin Creek was sufficient to satisfy all allotments (four priorities) until June 8. One hundred percent of third priorities were served until June 10. The flow then gradually decreased until mid-September when 95 percent of second priority allotments were being served. On September 15 the winter schedule of priorities became effective. Under this schedule, only 50 percent of second priority allotments were met.

Joseph Creek. A surplus water supply existed in Joseph Creek until July 6. The flow then receded rapidly until on July 22 only first priority allotments (four priorities) were served. Thereafter, the flow gradually decreased to 50 percent of first priority allotments at the end of the season.

Thoms Creek. A sufficient water supply existed in Thoms Creek to meet all allotments (three priorities) until July 11. The flow then gradually decreased to 6 percent of third priority allotments at the end of the season.

Gleason Creek. The available water supply in Gleason Creek was sufficient to satisfy fourth priority allotments (five priorities) until June 2. The flow then rapidly dropped to 100 percent of second priority allotments by July 13. By late July the creek was dry.

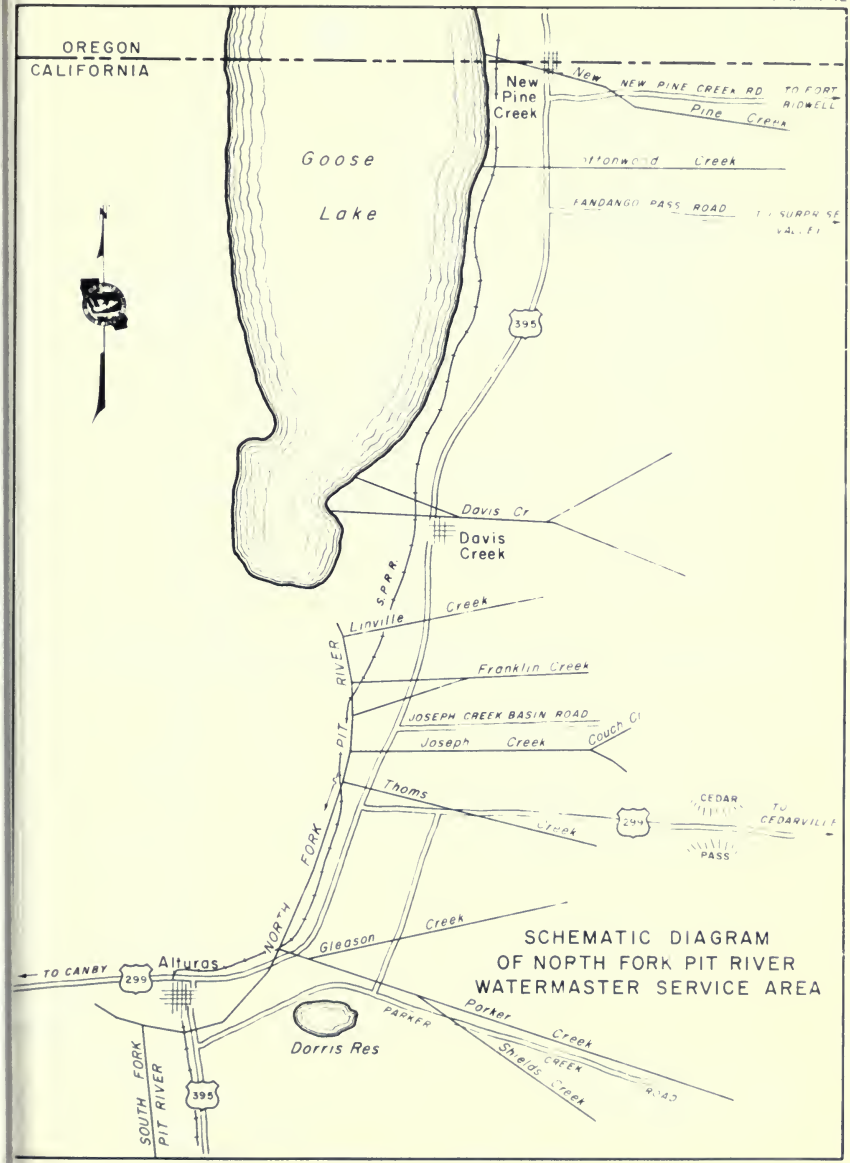
Shields Creek. A surplus water supply existed in Shields Creek until July 1. The flow decreased rapidly until approximately 75 percent of first priority allotments (four priorities) were served on September 1. The supply then gradually increased until the end of September when 60 percent of second priority allotments were being supplied.

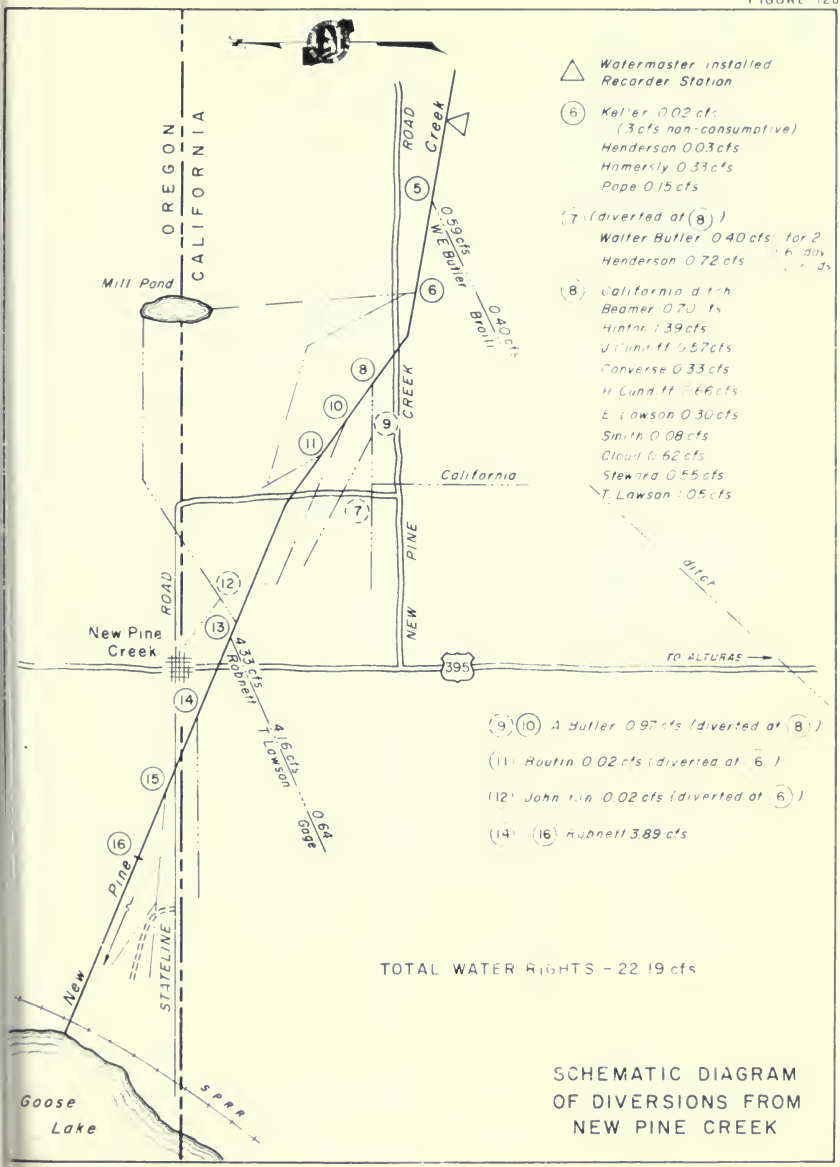
Parker Creek. The flow in Parker Creek peaked in mid-May. It then decreased steadily until July 14 when 100 percent of all allotments (four priorities) were served. From then until the end of July the flow continued to decrease gradually. Throughout the remainder of the season the flow remained constant at 15 percent of third priority allotments.

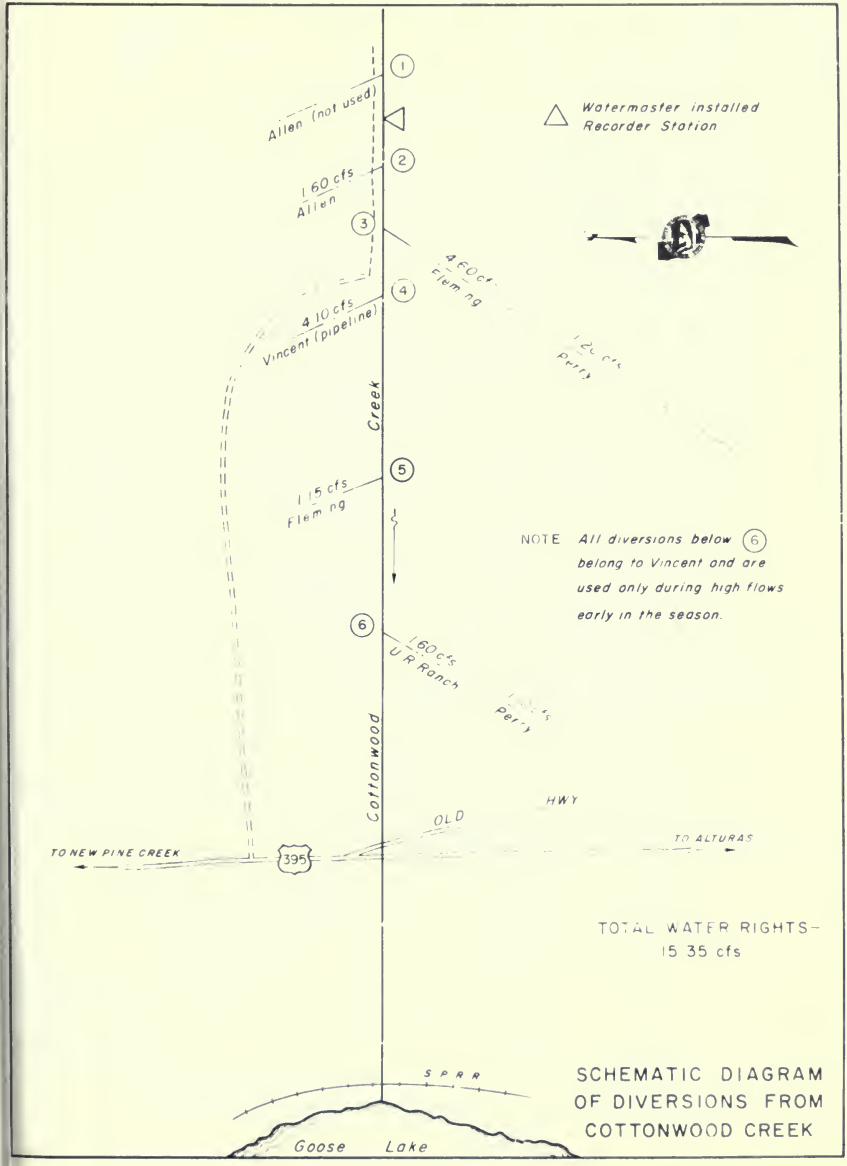
North Fork Pit River. A surplus water supply existed in the North Fork Pit River until June 24. On that date the Dorris Reservoir

allotment was reduced. The flow then decreased rapidly until June 19 when only first priority allotments (five priorities) were being served. The decrease continued until July 19 when only stockwater was available. This condition continued throughout the remainder of the season.

FIGURE 12

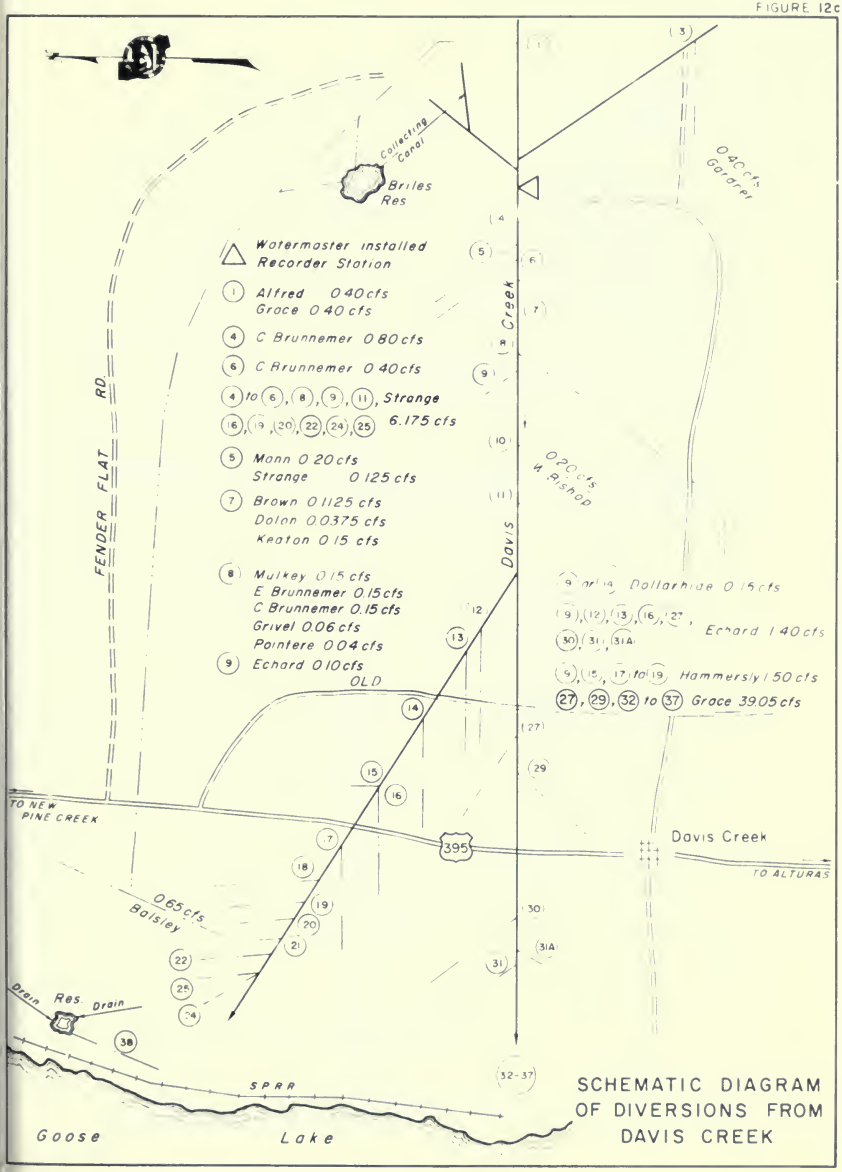

OREGON
CALIFORNIA
Goose
Lake
New
Pine
Creek
NEW PINE CREEK RD
TO FORT
RIDWELL
Pine Creek
Cottonwood Creek
FANDANGO PASS ROAD
395
Davis Cr
Davis
Creek
SPRR
Linville Creek
NORTH FORK PIT RIVER
Franklin Creek
JOSEPH CREEK BASIN ROAD
Joseph Creek
Couch Cr
Thoms Creek
CEDAR PASS
TO CEDARVILLE
244
Gleason Creek
TO CANBY
295
Alturas
PARKER
Parker Creek
Shields Creek
ROAD
Dorris Res
SOUTH FORK
PIT RIVER
395
SCHEMATIC DIAGRAM
OF NOPTH FORK PIT RIVER
WATERMASTER SERVICE AREA


OREGON
CALIFORNIA
Mill Pond
ROAD
Creek
5
0.59cfs W E Butler
0.40 cfs Broll
6
8
10
9
11
CREEK
California
7
PINE
NEW
ROAD
12
13
New Pine Creek
4.33 cfs Robnett
4.16 cfs T Lawson
0.64 Gage
14
15
16
New Pine
STATELINE
Goose Lake
SPRA
395
TO ALTURAS
direct
Watermaster installed Recorder Station
(6) Keller 0.02 cfs (.3 cfs non-consumptive)
Henderson 0.03 cfs
Hamersly 0.33 cfs
Pope 0.15 cfs
(7) (diverted at (8))
Walter Butler 0.40 cfs for 2
Henderson 0.72 cfs
(8) California ditch
Beamer 0.70 cfs
Hinton 1.39 cfs
J Cundiff 0.57 cfs
Converse 0.33 cfs
H Cundiff 0.66 cfs
E Lawson 0.30 cfs
Smith 0.08 cfs
Cloud 0.62 cfs
Steward 0.55 cfs
T Lawson 1.05 cfs
(9) (10) A Butler 0.97 cfs (diverted at (8))
(11) Boutin 0.02 cfs (diverted at (6))
(12) John Lin 0.02 cfs (diverted at (6))
(14) (16) Robnett 3.89 cfs
TOTAL WATER RIGHTS - 22.19 cfs
SCHEMATIC DIAGRAM OF DIVERSIONS FROM NEW PINE CREEK

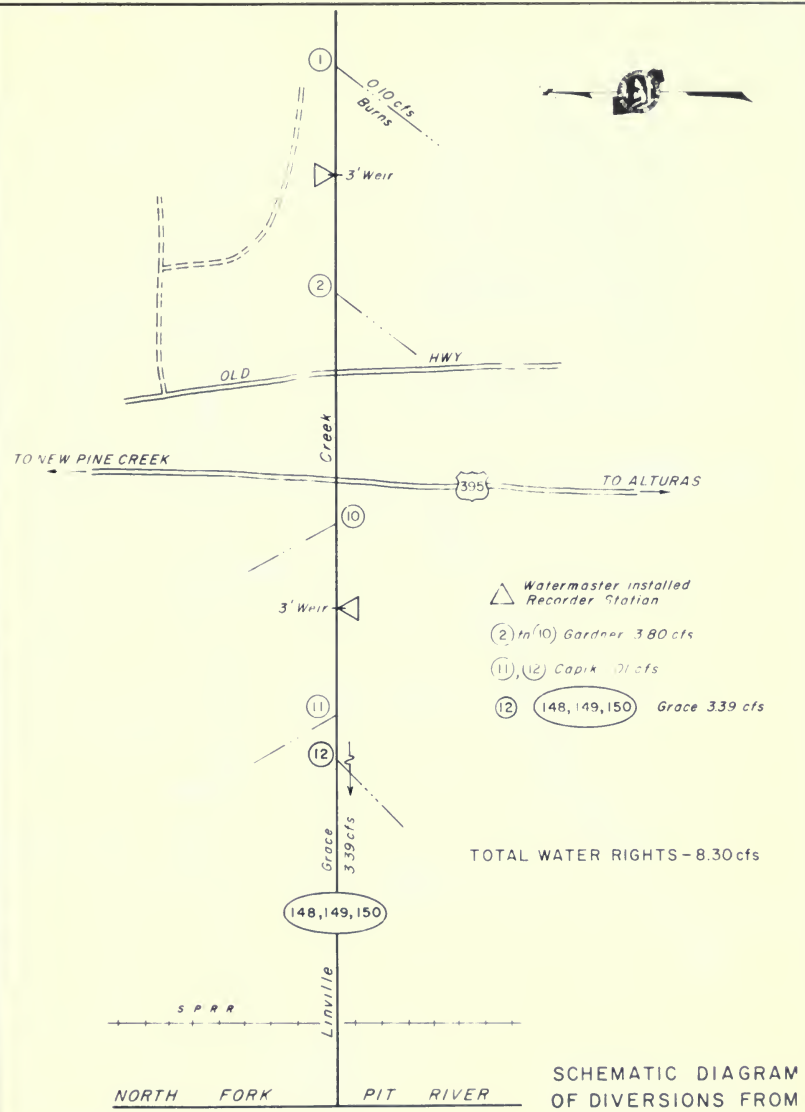


SCHEMATIC DIAGRAM OF DIVERSIONS FROM COTTONWOOD CREEK

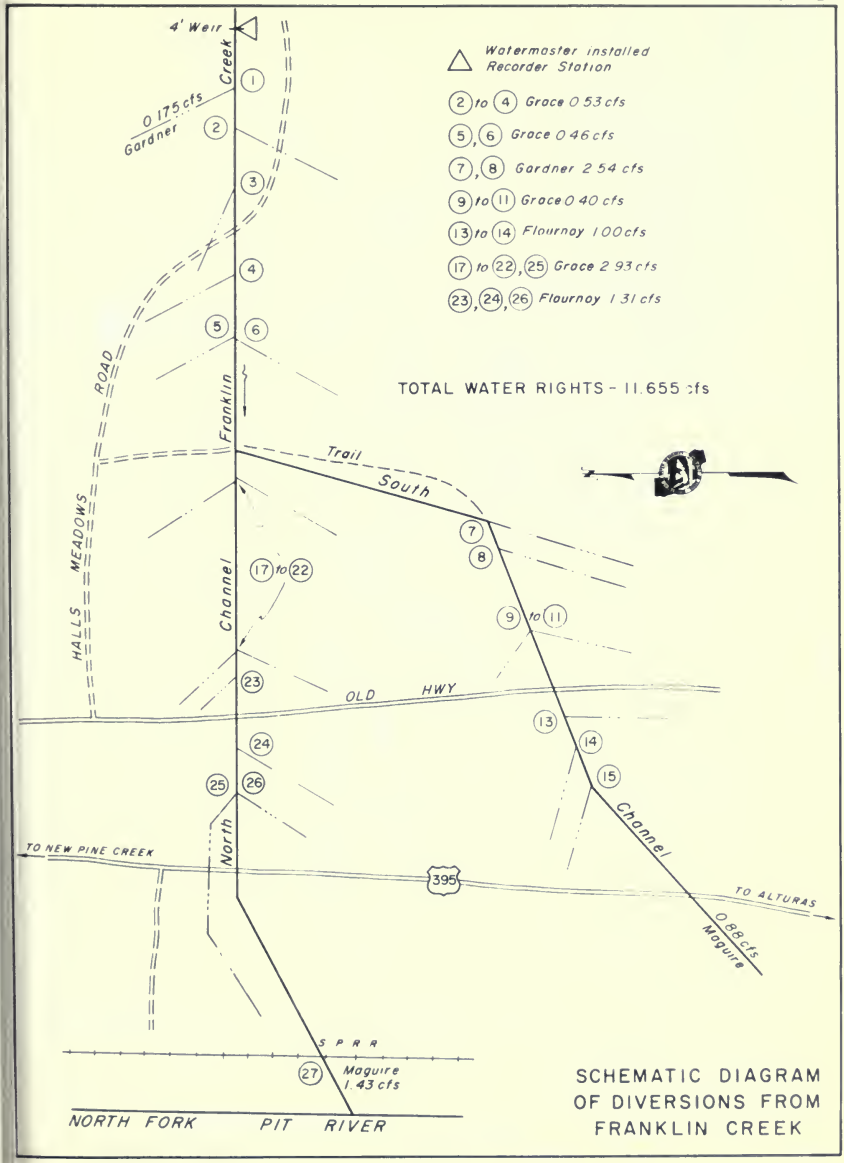
FIGURE 12c



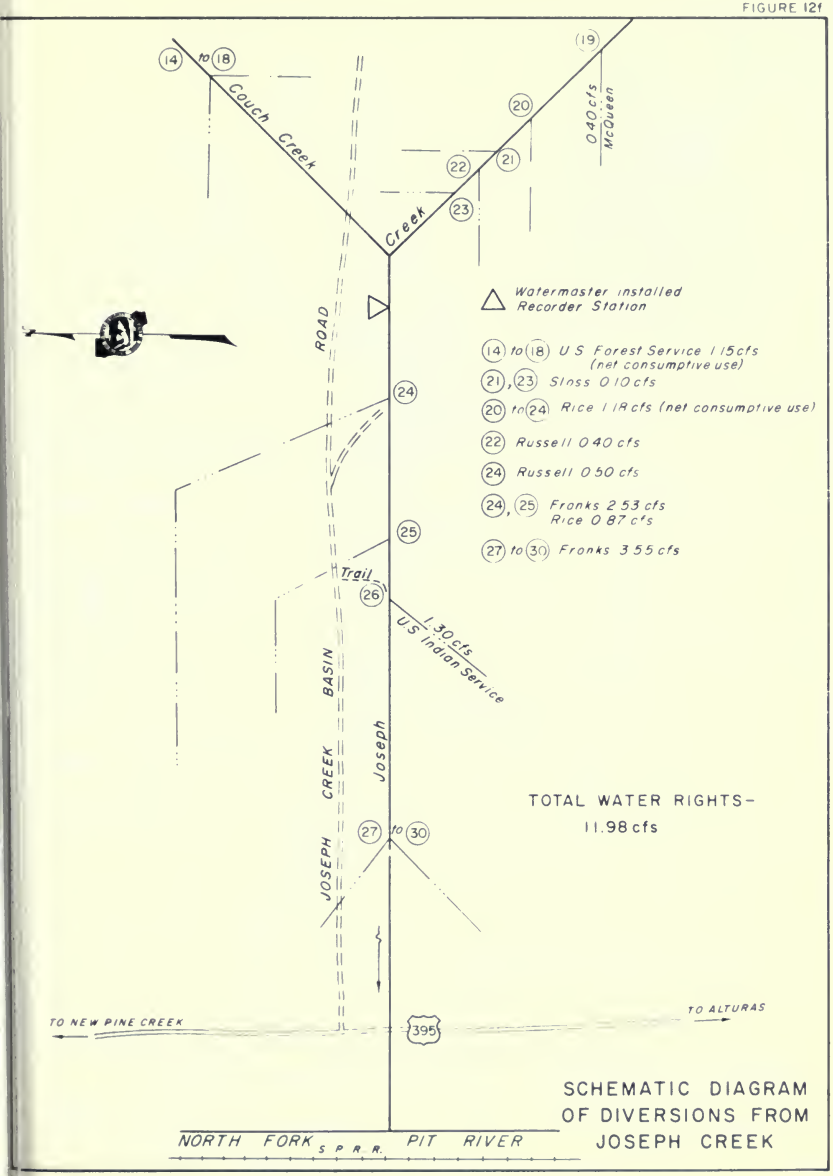
SCHEMATIC DIAGRAM OF DIVERSIONS FROM DAVIS CREEK



SCHEMATIC DIAGRAM OF DIVERSIONS FROM LINVILLE CREEK



SCHEMATIC DIAGRAM OF DIVERSIONS FROM FRANKLIN CREEK



SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
JOSEPH CREEK

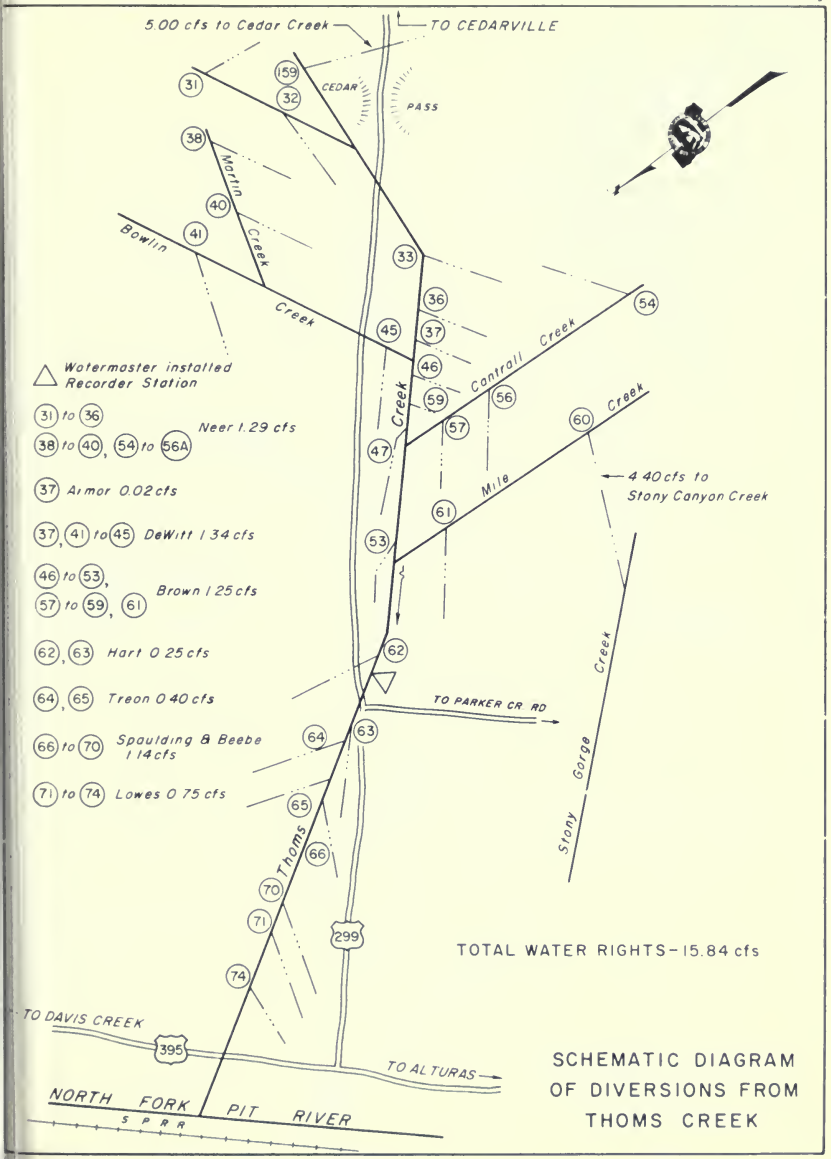
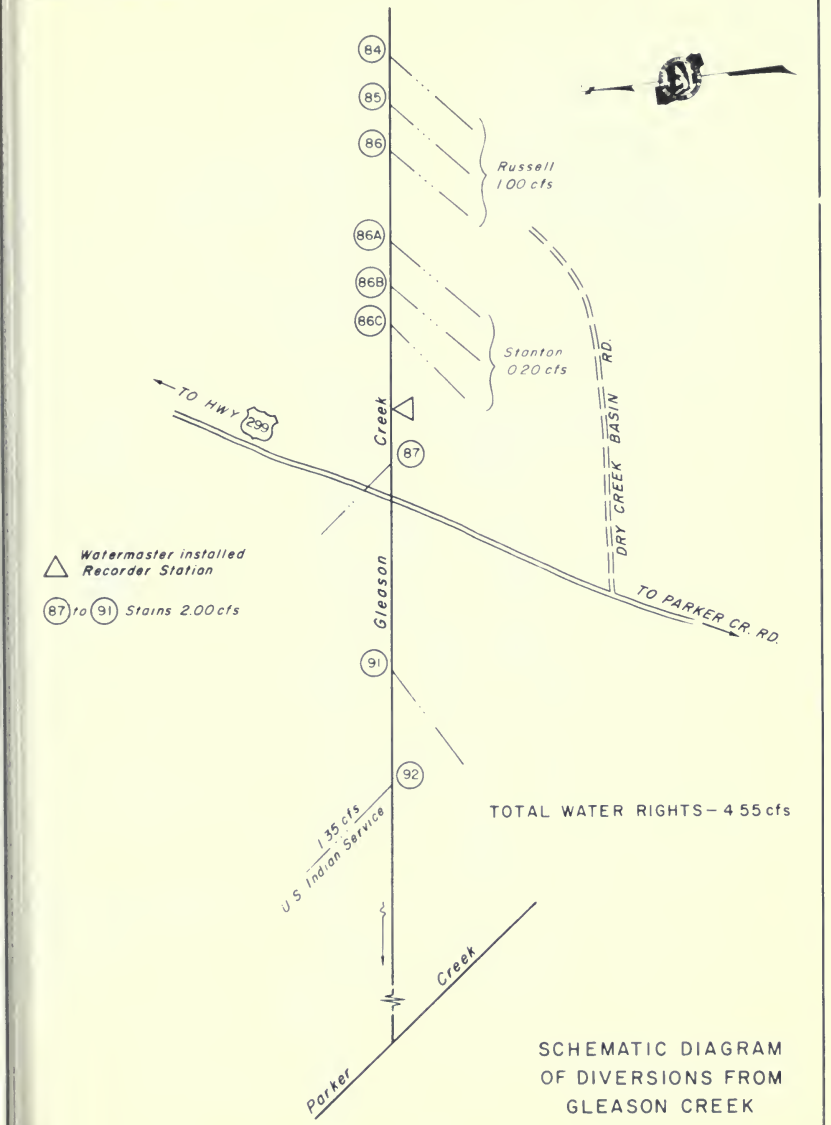

5.00 cfs to Cedar Creek
TO CEDARVILLE
CEDAR PASS
Martin Creek
Bowlin Creek
Contrail Creek
Creek
Mile Creek
4.40 cfs to Stony Canyon Creek
Stony Gorge Creek
TO PARKER CR. RD.
Thoms Creek
299
395
TO DAVIS CREEK
TO ALTURAS
NORTH FORK PIT RIVER
SPRR
△ Watermaster installed Recorder Station
31 to 36 Neer 1.29 cfs
38 to 40, 54 to 56A
37 Armor 0.02 cfs
37, 41 to 45 DeWitt 1.34 cfs
46 to 53, 57 to 59, 61 Brown 1.25 cfs
62, 63 Hart 0.25 cfs
64, 65 Treon 0.40 cfs
66 to 70 Spaulding & Beebe 1.14 cfs
71 to 74 Lowes 0.75 cfs
TOTAL WATER RIGHTS - 15.84 cfs
SCHEMATIC DIAGRAM OF DIVERSIONS FROM THOMS CREEK

FIGURE 12h


84
85
86
Russell
100 cfs
86A
86B
86C
Stanton
020 cfs
DRY CREEK BASIN RD.
TO HWY 299
Creek
87
Watermaster installed
Recorder Station
87 to 91 Stains 2.00 cfs
Gleason
TO PARKER CR. RD.
91
92
135 cfs
U S Indian Service
TOTAL WATER RIGHTS – 4 55 cfs
Creek
Parker
SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
GLEASON CREEK

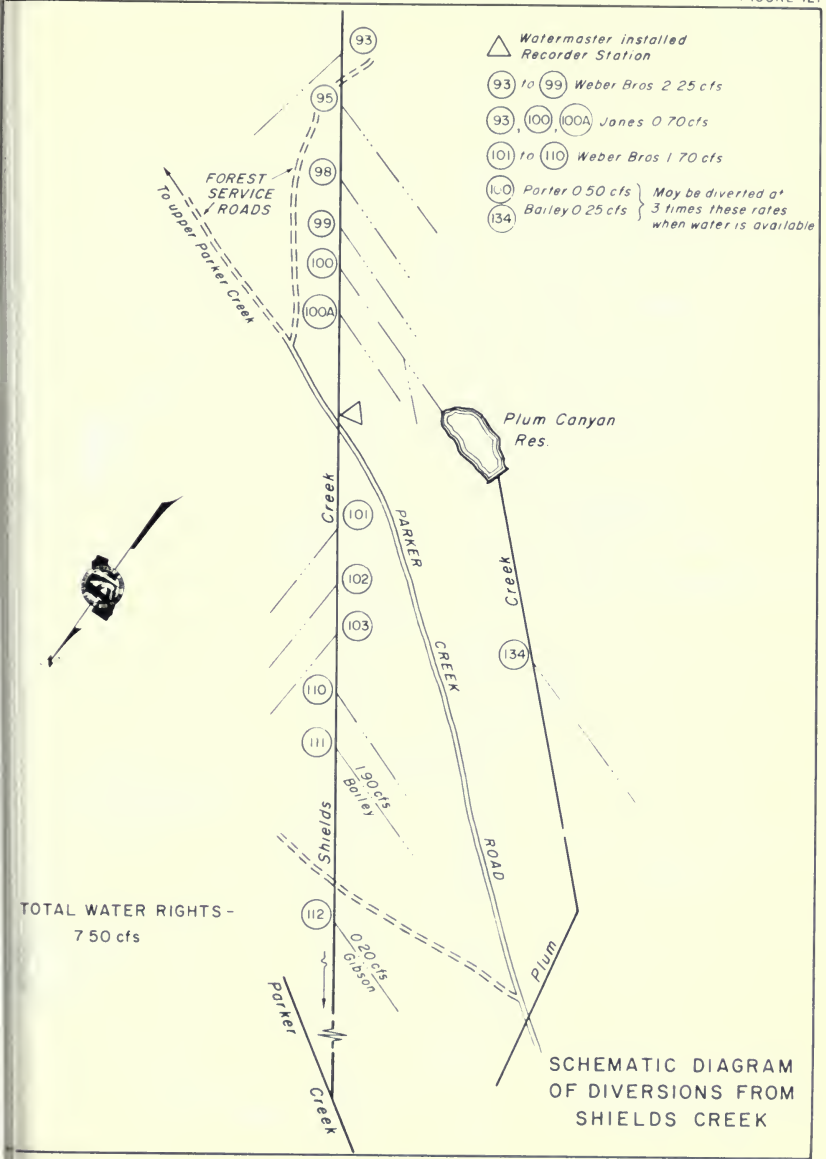
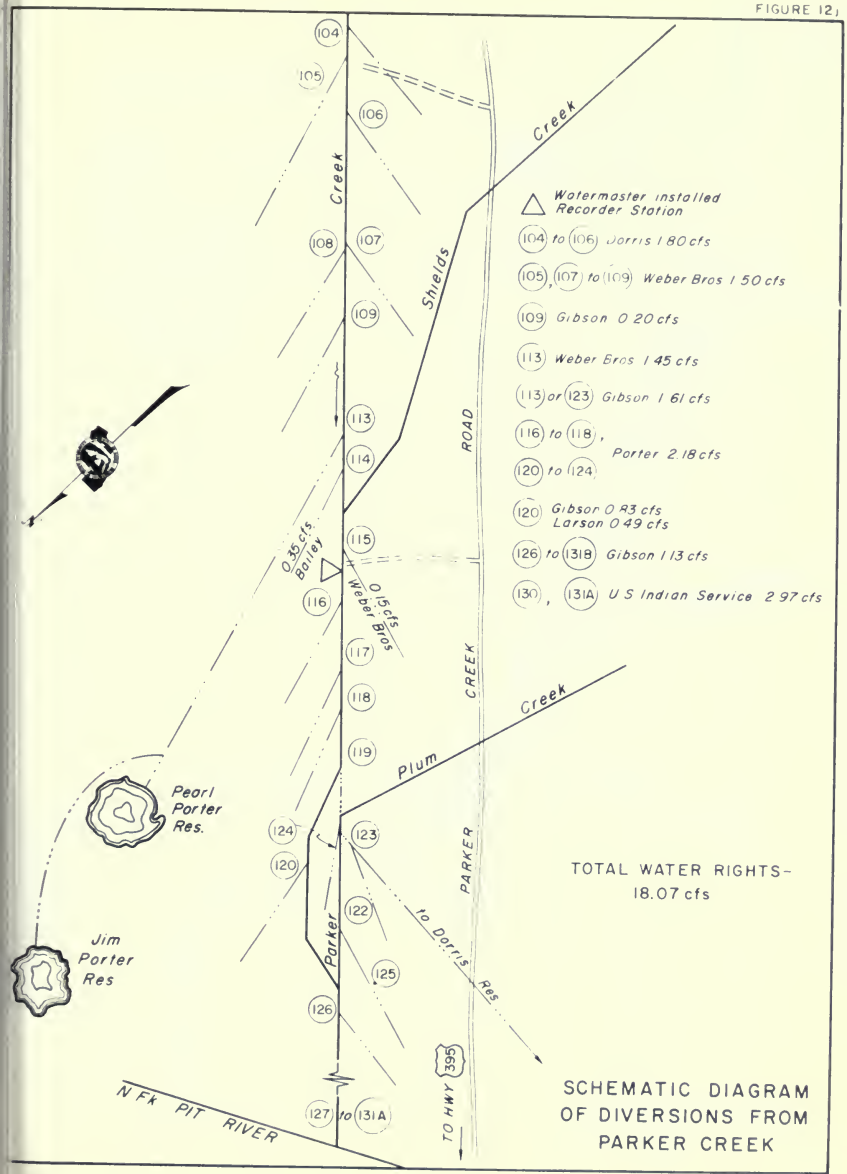
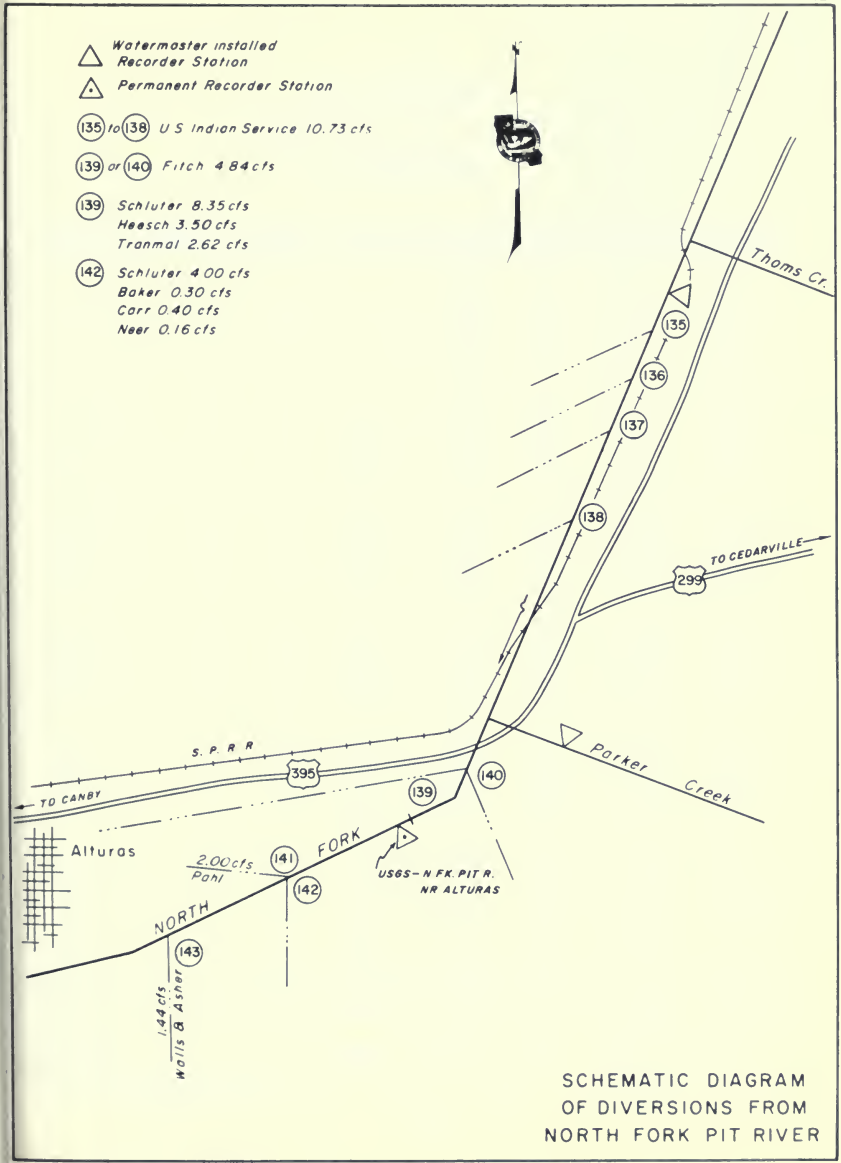

Watermaster installed Recorder Station
93 to 99 Weber Bros 2 25 cfs
93, 100, 100A Jones 0 70cfs
101 to 110 Weber Bros 1 70 cfs
140 Porter 0 50 cfs
134 Bailey 0 25 cfs
May be diverted at 3 times these rates when water is available
FOREST SERVICE ROADS
To upper Parker Creek
Plum Canyon Res.
Creek
PARKER CREEK
Creek
ROAD
Plum
Shields
1 90 cfs Bailey
0 20 cfs Gibson
Parker
Creek
TOTAL WATER RIGHTS - 7 50 cfs
SCHEMATIC DIAGRAM OF DIVERSIONS FROM SHIELDS CREEK

FIGURE 12)


104
105
106
107
108
109
113
114
115
116
117
118
119
120
122
123
124
125
126
127 to 131A
Creek
Shields
ROAD
Creek
Watermaster installed Recorder Station
104 to 106 Dorris 1 80 cfs
105, 107 to 109 Weber Bros 1 50 cfs
109 Gibson 0 20 cfs
113 Weber Bros 1 45 cfs
113 or 123 Gibson 1 61 cfs
116 to 118, 120 to 124 Porter 2 18 cfs
120 Gibson 0 83 cfs
Larson 0 49 cfs
126 to 1318 Gibson 1 13 cfs
130, 131A U S Indian Service 2 97 cfs
0.35 cfs Bailey
0 15 cfs Weber Bros
CREEK
Plum
Creek
PARKER
Parker
to Dorris Res
Pearl Porter Res.
Jim Porter Res
TOTAL WATER RIGHTS-
18.07 cfs
N Fk PIT RIVER
TO HWY 395
SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
PARKER CREEK



SCHEMATIC DIAGRAM OF DIVERSIONS FROM NORTH FORK PIT RIVER

TABLE 21
DAILY MEAN DISCHARGE

NEW PINE CREEK BELOW SCHROEDER'S

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1				83	41	17	5.5
2				77	41	16	5.3
3				77	40	16	5.3
4				77	49	15	5.3
5				77	38	15	5.3
6				77	37	14	5.2
7				77	35	13	5.2
8			25*	71	34	11	5.1
9			25	71	34	11	5.1
10			35	71	33	10	5.1
11			41	71	31	9.3	5.1
12			41	71	29	9.3	5.0
13			39	71	28	9.3	4.9
14			39	69	28	7.0	4.9
15			41	69	27	7.0	4.9
16			42	67	27	6.6	4.9
17			43	73	27	6.6	4.9
18			43	74	27	6.6	4.9
19			43	71	26	6.3	4.9
20			47	69	25	6.3	4.9
21			83	65	25	6.1	4.9
22			60	60	24	6.1	4.9
23			71	59	23	6.1	4.9
24			89	57	22	6.0	4.9
25			100	54	22	6.0	4.8
26			100	51	20	6.0	4.8
27			95	50	20	5.8	4.8
28			93	49	20	5.8	4.8
29			89	47	20	5.8	4.8**
30			89	45	18	5.5	
31			83		18	5.5	
Mean			60.7	66.7	28.7	8.9	5.0
Runoff in acre-feet			2890	3970	1760	549	288

* Beginning of Record
** End of Record

TABLE 22
DAILY MEAN DISCHARGE

COTTONWOOD CREEK BELOW LARKIN GARDEN DITCH

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1					10	3.7	0.3
2					10	3.6	0.3
3					9.7	3.3	0.3
4					9.6	3.4	0.3
5					9.2	3.3	0.3
6					8.8	3.3	0.3
7					8.8	3.3	0.3
8					8.6	3.3	0.3
9					8.6	3.2	0.3
10					8.4	3.1	0.3
11					8.2	2.9	0.3
12					8.0	2.3	0.3
13					7.8	2.2	0.3
14					7.6	2.2	0.3
15					7.3	2.1	0.3
16					7.0	1.4	0.3
17					6.6	1.2	0.3
18					6.2	0.7	0.3
19				18*	6.2	0.7	0.3
20				18	5.7	0.5	0.3
21				18	5.7	0.5	0.3
22				17	5.5	0.4	0.3
23				16	5.5	0.3	0.3
24				15	5.4	0.3	0.3
25				15	5.2	0.3	0.3
26				14	5.2	0.3	0.3
27				14	4.8	0.3	0.4
28				14	5.0	0.3	0.4
29				13	5.1	0.3	0.4
30				12	4.5	0.3	0.4
31					3.8	0.3	
Mean				15.3	7.0	1.7	0.3
Runoff in acre-feet				369	432	105	19

* Beginning of Record

TABLE 23
DAILY MEAN DISCHARGE

DAVIS CREEK AT OLD FISH WHEEL

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1				55	18	6.5	5.2
2				51	17	6.5	4.8
3				46	15	7.2	4.8
4				39	15	7.2	4.5
5				33	14	7.5	4.5
6				46	14	7.5	4.5
7				49	14	7.2	4.3
8			45*	46	15	6.5	4.2
9			55	46	15	6.5	4.0
10			63	43	14	6.5	3.7
11			56	44	14	6.0	3.7
12			55	46	14	6.0	3.7
13			47	42	12	6.0	3.7
14			45	40	12	6.0	4.0
15			46	42	12	5.8	4.0
16			56	43	12	5.8	4.2
17			66	42	14	5.8	4.2
18			77	40	12	5.8	4.2
19			81	36	12	5.8	4.2
20			80	38	12	5.8	4.0
21			81	37	11	5.8	4.0
22			86	34	10	5.8	4.0
23			84	30	9.5	5.8	4.0
24			77	26	9.0	5.8	4.0
25			70	25	7.4	5.8	4.0
26			66	21	7.4	5.8	4.0
27			66	21	7.2	5.8	4.0
28			64	20	7.2	5.8	4.0
29			70	20	6.5	5.8	4.0
30			68	18	7.2	5.2	4.0
31			67		7.2	5.2	
Mean			65.5	37.3	11.8	6.1	4.0
Runoff in acre-feet			3120	2220	727	378	247

* Beginning of Record

TABLE 24
DAILY MEAN DISCHARGE
LINVILLE CREEK AT OLD POWER HOUSE
March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1				3.0	2.1	1.9	2.0
2				2.9	2.1	1.9	2.0
3				2.7	2.1	1.9	2.1
4				2.7	2.0	1.9	2.1
5				2.8	2.0	2.0	2.1
6				2.8	2.0	2.1	2.1
7				2.8	2.0	2.1	2.1
8				2.7	2.0	2.1	2.2
9			3.4*	2.7	2.0	2.1	2.2
10			3.4	2.6	2.0	2.1	2.2
11			3.1	2.6	2.0	2.0	2.2
12			3.1	2.5	2.0	2.0	2.2
13			3.0	2.5	2.0	2.0	2.3
14			3.0	2.4	2.0	2.0	2.3
15			3.0	2.3	2.0	2.0	2.3
16			3.1	2.3	2.0	2.0	2.3
17			3.7	2.3	2.0	2.0	2.3
18			4.0	2.3	2.0	2.0	2.3
19			3.9	2.2	2.0	2.0	2.3
20			3.9	2.2	2.0	2.0	2.3
21			4.0	2.2	2.0	1.8	2.3
22			4.1	2.2	2.0	2.0	2.3
23			4.1	2.2	2.0	2.1	2.3
24			4.0	2.2	2.0	2.1	2.3
25			3.8	2.2	2.0	2.1	2.3
26			3.7	2.2	1.7	2.1	2.3
27			3.5	2.1	1.6	2.1	2.3
28			3.5	2.1	1.8	2.1	2.3
29			3.4	2.1	1.9	2.0	2.3
30			3.2	2.1	1.9	2.0	2.3
31			3.1		1.9	2.0	
Mean			3.5	2.4	2.0	2.0	2.2
Runoff in acre-feet			161	145	121	124	133

* Beginning of Record

TABLE 25
DAILY MEAN DISCHARGE

FRANKLIN CREEK ABOVE DIVERSIONS

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1				13	2.9	2.0	1.8
2				8.5	2.6	2.0	1.8
3				7.1	2.6	2.0	1.8
4				6.8	2.6	2.0	1.8
5				7.7	2.8	2.0	1.8
6				12	2.5	2.0	1.8
7				12	2.5	2.0	1.8
8			36*	12	2.4	1.9	1.8
9			42	11	2.4	1.9	1.8
10			37	9.0	2.3	1.9	1.7
11			34	7.7	2.3	1.9	1.7
12			28	7.7	2.3	1.9	1.7
13			29	7.0	2.2	1.9	1.7
14			31	6.5	2.1	1.9	1.7
15			36	6.0	2.1	1.9	1.7
16			40	5.6	2.2	1.9	1.7
17			40	5.3	2.2	1.9	1.7
18			32	5.2	2.2	1.9	1.7
19			31	5.0	2.1	1.9	1.7
20			29	4.6	2.1	1.9	1.6
21			31	4.6	2.1	1.9	1.6
22			32	4.5	2.1	1.9	1.6
23			33	4.4	2.1	1.9	1.6
24			32	4.0	2.1	1.9	1.6
25			28	3.8	2.1	1.9	1.6
26			27	3.7	2.1	1.9	1.6
27			24	3.3	2.1	1.8	1.6
28			23	3.2	2.1	1.8	1.6
29			21	3.2	2.1	1.8	1.6
30			17	3.1	2.1	1.8	1.6
31			15		2.0	1.8	
Mean			30.3	6.6	2.3	1.9	1.7
Runoff in acre-feet			1440	392	140	117	101

* Beginning of Record

TABLE 26
DAILY MEAN DISCHARGE
JOSEPH CREEK BELOW COUCH CREEK
March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1				42	9.1	1.7	1.3
2				36	9.1	1.7	1.3
3				30	9.1	1.7	1.3
4				24	9.1	1.7	1.3
5				24	9.1	1.7	1.3
6				30	9.1	1.7	1.3
7				30	7.1	1.6	1.3
8				18	6.1	1.5	1.3
9			53*	18	4.2	1.4	1.3
10			42	18	4.2	1.4	1.3
11			36	18	4.2	1.4	1.3
12			24	18	4.2	1.3	1.3
13			30	18	4.2	1.3	1.3
14			42	18	3.0	1.3	1.3
15			48	18	3.0	1.3	1.3
16			59	18	3.0	1.3	1.3
17			65	18	3.0	1.3	1.3
18			71	18	3.0	1.3	1.3
19			65	18	3.0	1.3	1.3
20			59	18	3.0	1.3	1.3
21			59	13	3.0	1.3	1.3
22			59	13	3.0	1.2	1.3
23			59	13	1.7	1.2	1.3
24			59	10	1.7	1.2	1.3
25			59	10	1.7	1.2	1.2
26			53	10	1.7	1.3	1.2
27			42	10	1.6	1.3	1.2
28			42	10	1.7	1.3	1.2
29			42	10	1.7	1.3	1.2
30			36	10	1.7	1.3	1.2
31			36		1.7	1.3	
Mean			49.6	18.6	4.2	1.4	1.3
Runoff in acre-feet			2260	1110	258	85	76

* Beginning of Record

TABLE 27
DAILY MEAN DISCHARGE

NORTH FORK PIT RIVER BELOW THOMS CREEK

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1				137	21	1.5	4.1
2				135	20	1.5	4.1
3				121	18	4.4	4.2
4				110	14	4.4	4.3
5				109	10	4.4	4.2
6				132	7.5	4.3	4.1
7				126	7.6	4.3	4.1
8			172*	112	8.0	4.5	4.1
9			190	109	4.7	4.5	4.1
10			190	101	4.5	4.5	4.1
11			178	98	6.0	4.5	3.0
12			195	91	4.5	4.5	1.5
13			183	88	4.0	4.4	1.5
14			178	85	3.3	4.4	1.5
15			172	83	3.2	4.4	1.5
16			178	80	1.9	4.3	1.4
17			194	74	4.5	4.3	1.4
18			212	72	3.2	4.3	1.4
19			207	63	2.5	4.3	1.4
20			195	54	2.2	4.2	1.4
21			195	50	2.1	4.2	1.4
22			190	48	1.5	4.2	1.3
23			190	45	1.4	4.2	1.3
24			178	40	1.5	4.2	1.3
25			166	35	1.6	4.2	1.3
26			156	34	1.5	4.3	1.3
27			147	26	1.5	4.3	1.3
28			139	26	1.5	4.2	1.3
29			132	22	1.5	4.1	1.3
30			126	21	1.4	4.1	1.3
31			132		1.5	4.1	
Mean			175	77.6	5.4	4.1	2.4
Runoff in acre-feet			8320	4620	332	254	140

* Beginning of Record

TABLE 28
DAILY MEAN DISCHARGE
THOMS CREEK AT CEDARVILLE-ALTURAS HIGHWAY
March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1				66	4.2	0.9	0.3
2				79	4.2	0.8	0.4
3				77	3.8	0.8	0.4
4				73	3.2	0.8	0.4
5				96	2.9	0.7	0.4
6				96	2.8	0.8	0.4
7				79	2.6	0.8	0.4
8				66	2.4	0.6	0.4
9				51	2.3	0.6	0.4
10				39	2.2	0.6	0.4
11				31	2.0	0.5	0.4
12				27	1.9	0.5	0.4
13				24	1.8	0.4	0.4
14				21	1.6	0.4	0.4
15				18	1.5	0.4	0.4
16			110*	15	1.8	0.3	0.4
17			103	14	1.8	0.3	0.5
18			103	12	1.1	0.3	0.5
19			107	11	1.1	0.3	0.5
20			103	10	1.0	0.3	0.4
21			103	10	1.0	0.3	0.4
22			107	9.0	0.8	0.3	0.4
23			107	7.9	0.6	0.3	0.4
24			105	7.0	1.0	0.3	0.4
25			79	6.5	0.9	0.3	0.4
26			73	6.4	0.9	0.3	0.4
27			70	6.0	0.9	0.3	0.4
28			46	5.5	0.9	0.3	0.4
29			40	5.0	0.9	0.2	0.4
30			40	4.7	0.8	0.4	0.4
31			41		0.9	0.2	
Mean			83.6	32.4	1.8	0.5	0.4
Runoff in acre-feet			2650	1930	111	28	24

* Beginning of Record

TABLE 29
DAILY MEAN DISCHARGE
PARKER CREEK AT FOGARTY RANCH
March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1				78	15	.4	1.1
2			32*	85	15	2.0	1.1
3			35	85	15	1.6	1.1
4			44	95	13	1.1	1.1
5			61	118	14	1.0	1.1
6			79	118	14	1.1	1.1
7			123	101	13	1.1	1.1
8			151	92	13	1.1	1.1
9			176	86	13	1.1	1.2
10			141	80	12	1.1	1.2
11			115	70	12	1.1	1.2
12			104	64	11	1.1	1.2
13			105	55	11	1.1	1.3
14			123	52	11	1.1	1.3
15			147	47	10	1.1	1.3
16			164	44	10	1.1	1.3
17			176	41	9.3	1.1	1.3
18			177	38	9.0	1.1	1.3
19			172	34	8.7	1.1	1.4
20			157	30	8.1	1.1	1.3
21			157	27	8.0	1.1	1.3
22			155	26	7.8	1.1	1.2
23			141	24	7.3	1.1	1.2
24			129	22	7.0	1.1	1.2
25			100	21	6.7	1.1	1.2
26			101	19	7.9	1.1	1.1
27			92	18	8.5	1.1	1.1
28			86	17	7.2	1.1	1.1
29			84	16	6.0	1.1	1.2
30			72	14	4.9	1.1	1.2
31			73		3.9	1.1	
Mean			115.8	53.9	10.1	1.2	1.2
Runoff in acre-feet			6890	3210	621	73	71

* Beginning of Record

TABLE 30
DAILY MEAN DISCHARGE

SHIELDS CREEK BELOW PEPPERDINE RANCH

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1				8.1	3.7	1.4	0.3
2			6.5*	8.6	3.7	1.3	0.4
3			6.5	8.1	2.9	1.3	0.6
4			6.5	8.1	2.9	1.3	0.7
5			7.4	8.6	2.9	1.5	0.7
6			8.1	9.0	2.9	1.4	0.7
7			9.4	8.6	2.9	1.3	0.8
8			10	8.1	2.9	1.3	0.8
9			10	8.1	2.9	1.2	0.6
10			9.4	8.1	2.9	1.2	0.6
11			9.2	7.4	2.9	1.2	0.7
12			9.0	7.4	2.9	1.1	0.9
13			8.6	7.4	2.9	1.0	0.8
14			8.6	7.4	2.9	0.9	0.8
15			9.0	7.4	2.9	0.9	0.8
16			9.8	7.4	1.9	0.9	1.1
17			10	7.4	1.4	1.0	2.9
18			10	6.5	1.2	1.1	2.9
19			9.8	6.5	1.2	1.3	2.7
20			9.8	5.6	1.3	1.0	2.7
21			9.8	5.6	1.4	0.8	2.5
22			10	5.6	1.3	0.8	2.5
23			9.4	6.5	0.5	0.8	2.5
24			9.2	6.5	0.6	0.9	2.5
25			8.6	5.6	1.1	1.2	2.5
26			8.1	5.6	1.0	1.5	2.5
27			7.4	5.6	1.0	1.8	2.5
28			8.1	5.6	1.1	1.4	2.4
29			8.1	4.6	1.2	1.2	2.4
30			7.4	4.6	1.2	0.8	2.4
31					1.3	0.4	
Mean			8.7	7.0	2.1	1.1	1.6
Runoff in acre-feet			503	416	127	70	94

* Beginning of Record -

TABLE 31
DAILY MEAN DISCHARGE
PARKER CREEK ABOVE HIGHWAY 395 NEAR ALTURAS

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1				47	11	3.0	0.8
2				44	8.1	2.8	0.7
3				40	4.6	2.6	0.7
4				39	5.9	2.3	0.7
5				44	6.0	2.1	0.6
6				59	6.1	2.0	0.5
7				48	5.2	2.0	0.3
8				43	6.3	2.0	0.3
9				41	5.7	2.0	0.2
10				38	5.5	2.0	0.2
11				35	5.4	2.0	0.2
12				33	4.4	1.9	0.2
13				30	4.5	1.7	0.2
14				23	5.1	1.3	0.2
15				12	5.5	1.1	0.2
16				9.0	5.6	1.1	0.2
17			80*	8.5	5.5	1.1	0.2
18			83	7.0	3.9	1.1	0.3
19			79	6.6	3.2	1.1	0.4
20			67	9.0	3.0	1.0	0.5
21			66	11	2.8	1.0	0.6
22			68	11	3.0	1.0	0.7
23			62	12	3.0	1.0	0.8
24			51	11	3.0	1.0	0.8
25			47	8.7	3.0	1.0	0.9
26			38	7.0	2.8	0.9	0.9
27			36	7.0	3.0	0.9	0.9
28			35	8.9	3.0	0.9	0.9
29			37	13	3.0	0.9	1.0
30			35	12	3.0	0.9	1.0
31			41		3.0	0.8	
Mean			55.0	23.9	4.6	1.5	0.5
Runoff in acre-feet			1640	1420	284	92	32

* Beginning of Record

TABLE 32
DAILY MEAN DISCHARGE
NORTH FORK PIT RIVER NEAR ALTURAS

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	34	38	108	235	22	0.4	0.9
2	32	38	104	208	28	0.2	0.8
3	27	38	95	164	6.6	0.3	0.6
4	23	33	90	138	7.8	2.4	0.6
5	23	40	90	157	29	2.4	0.8
6	25	50	106	232	2.1	1.2	0.8
7	28	72	190	195	0.6	0.9	0.8
8	28	133	300	164	0.6	0.8	0.8
9	32	86	410	153	0.5	0.6	0.6
10	32	72	347	138	0.3	0.6	0.6
11	29	67	280	122	0.3	0.6	0.6
12	33	60	262	115	0.3	0.6	0.6
13	32	57	218	104	0.2	0.6	0.6
14	33	67	225	80	0.2	0.5	0.9
15	27	111	275	48	0.2	0.5	1.2
16	144	101	344	41	0.2	0.4	1.8
17	121	74	389	38	0.2	0.4	1.0
18	90	74	417	15	0.2	0.2	1.0
19	81	79	404	20	0.2	0.2	0.9
20	64	76	353	25	0.2	0.2	0.8
21	57	65	341	23	0.2	0.2	0.8
22	57	69	353	24	0.2	0.2	0.8
23	55	84	220	41	0.2	0.3	0.6
24	52	83	260	30	0.3	0.4	0.8
25	50	125	232	15	0.2	0.5	0.8
26	47	133	190	17	0.3	0.5	0.8
27	40	147	159	15	6.1	0.5	0.8
28	38	252	155	15	17	0.9	0.8
29	36	200	157	29	20	1.2	0.3
30	42	125	140	37	2.7	1.0	0.3
31	39		183		0.4	1.0	
Mean	46.8	88.3	239	87.9	4.8	0.7	0.8
Runoff in acre-feet	2880	5250	14670	5230	292	41	47

Shackleford Creek Watermaster Service Area

The Shackleford Creek service area is located in western Siskiyou County near the town of Fort Jones in Scott Valley. There are 21 water right owners in the service area with total allotments of 63.98 cubic feet per second. The major sources of water supply for this service area are Shackleford Creek, which flows through the central part of Quartz Valley, and its tributary, Mill Creek, which rises east of the headwaters of Shackleford Creek. Evans Creek, a small tributary to Mill Creek, enters from the south.

The service area encompasses the Quartz Valley region of Scott Valley and includes the entire agricultural area within the Shackleford Creek Basin. It is about two miles wide by six miles long with the main axis and drainage running from south to north. Elevations on the agricultural area range from about 3,100 feet at the south to about 2,650 feet at the confluence of Shackleford Creek and Scott River.

A schematic drawing of the Shackleford Creek stream system is presented as Figures 13 and 13a, pages 147 and 149.

Water Supply

The water supply for Shackleford Creek is derived from snowmelt runoff, springs and seepage, and supplemental stored water released from Cliff Lake and Campbell Lake. These lakes are located near the headwaters of Shackleford Creek.

The watershed of the Shackleford Creek stream system contains about 31 square miles, located in the heavily forested, steep, mountainous terrain of the northeasterly slopes of the Salmon Mountains. It varies in elevation from about 7,000 feet along its west rim to about 3,000 feet at the foot of the slopes bordering Quartz Valley.

Snowmelt runoff is normally sufficient to supply all demands until the middle of July. The supply then usually decreases until the

first part of August when water is released from Cliff and Campbell Lakes to maintain sufficient flow for second priority allotments in the Shackleford Ditch.

There were no stream gaging stations operated in the Shackleford Creek service area during 1967. However, several stations were maintained in various diversion ditches.

Method of Distribution

Irrigation is accomplished primarily by wild flooding of permanent pasture and alfalfa fields. Water is distributed by ditches and laterals to the places of use. Shackleford Ditch, the largest of these ditches, has a length of about six miles and a capacity of about 12 cubic feet per second.

The Shackleford Creek decree (see Table 1) provides four separate areas of distribution within the service area and establishes the following number of priority classes for these areas: Upper Shackleford Creek - seven; Lower Shackleford Creek - seven; Upper Mill Creek - three; and Lower Mill Creek - two.

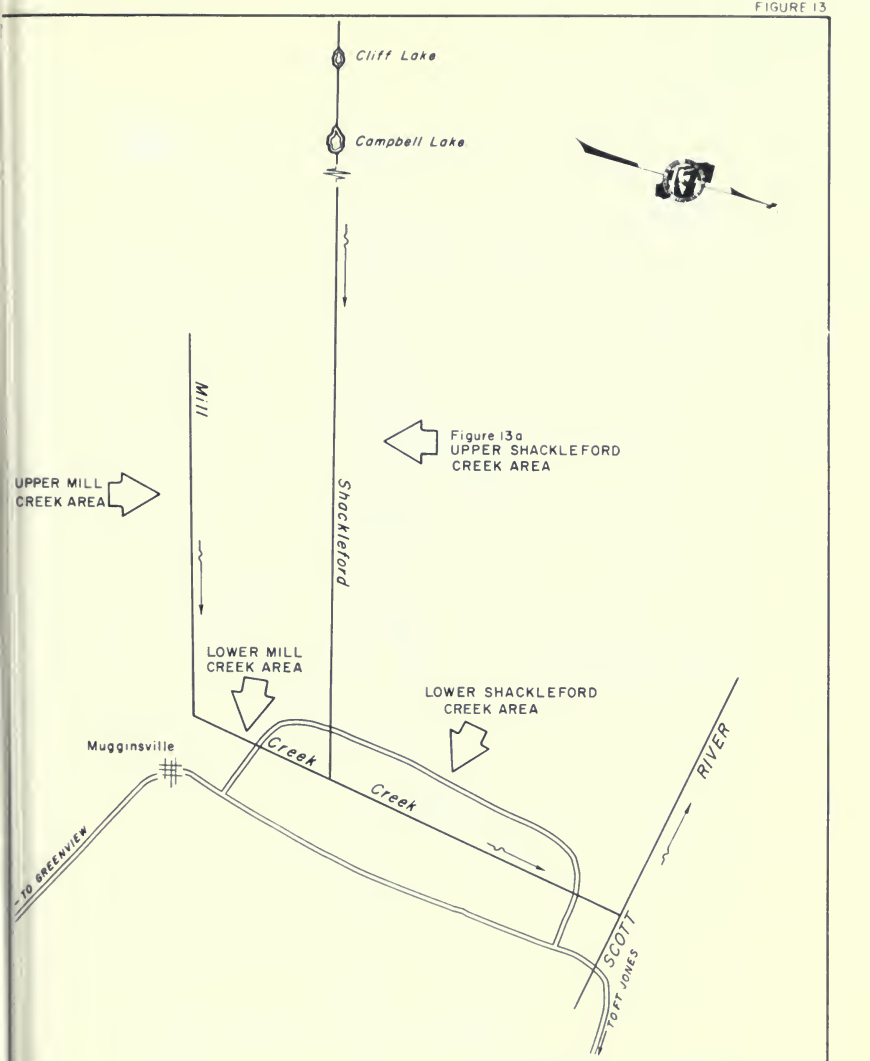
1967 Distribution

Watermaster service began June 1 in the Shackleford Creek service area and continued until September 30. Harold B. German, Water Resources Engineering Associate, was watermaster during this period.

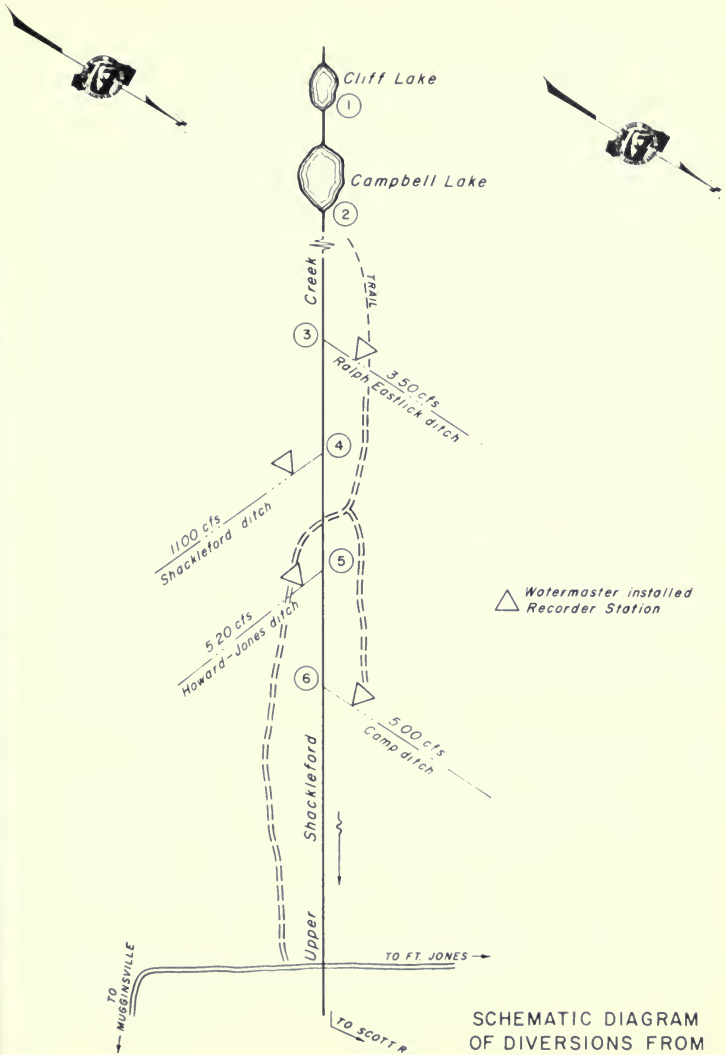
The available water supply was above normal early in the season but only about normal after August 1. Water right owners in the Howard-Jones Ditch did not use any of their water during the 1967 season. Their fourth priority allotments (seven priorities in the service area) were therefore available for use by owners of lower priorities.

Special Occurrences

New weirs were installed in the upper three diversions this season, and the weir and recorder station on the Ralph Eastlick Ditch was moved upstream. Logging activities above the former station caused it to fill with sand and gravel, thus necessitating the new location.



SCHEMATIC DIAGRAM
OF SHACKLEFORD CREEK
WATERMASTER SERVICE AREA



SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
UPPER SHACKLEFORD CREEK

Shasta River Watermaster Service Area

The Shasta River service area is located in the central part of Siskiyou County, south and east of the town of Yreka. There are 108 water right owners in the service area with total allotments of 594.612 cubic feet per second.

The source of water supply is Shasta River and its several tributaries. The upper reaches of the service area are served by two groups of tributaries. One group, comprising Boles, Beaughan, Carrick, and Jackson Creeks, rises on the northwestern slopes of Mount Shasta. The other group, consisting of Dale and Eddy Creeks, and Shasta River west of U. S. Highway 99, rises on the eastern slopes of the Trinity Mountains. All these streams join the main stem of the Shasta River above Dwinnell Reservoir near the town of Weed. As the Shasta River flows northward from Dwinnell Reservoir to its confluence with the Klamath River, north of Yreka, it is joined by three major tributaries. Parks Creek, rising on the eastern slopes of the Trinity Mountains, enters from the west near the town of Gazelle. Big Springs Creek, from Big Springs Lake, enters from the east about a mile below Parks Creek. Little Shasta River, rising on the western slopes of the mountainous area between Butte Valley and Shasta Valley, enters from the east near the town of Montague.

The place of use is in Shasta Valley which is approximately 30 miles long and 30 miles wide. The valley has numerous small, cone-shaped, volcanic hillocks scattered throughout its central portion that produce the effect of dividing the area into a number of distinctively separate parts. Because of these formations only about 141,000 acres of the approximately 507,000 acres within the valley are irrigable. The valley floor elevation averages approximately 3,000 feet.

A schematic drawing of each major stream system within the Shasta River service area is presented as Figures 14 through 14i, pages 157 through 175.

Water Supply

The water supply for Shasta Valley is derived from snowmelt runoff, springs and underground flow, and occasional summer thunder showers. In several portions of the stream system the spring and underground flow is adequate to supply most allotments throughout the season. Much of the underground flow is derived from the northern slopes of Mount Shasta, which rises to an elevation of 14,162 feet at the south end of Shasta Valley. Although the snowpack on Mount Shasta is usually heavy, there is negligible surface runoff.

Parks Creek, Upper Shasta River, and Little Shasta River derive a major portion of their water supply from snowmelt runoff. This flow is usually adequate to supply all allotments until the middle of May.

Beaughan Creek, Carrick Creek, Shasta River from Boles Creek to Dwinnell Reservoir, Big Springs, and Lower Shasta River have enough runoff from springs to supply a large percentage of the allotments throughout the season.

Records of the daily mean discharge at several stream gaging stations in the Shasta River service area are presented in Tables 33 through 39, pages 177 through 183.

Methods of Distribution

Irrigation of permanent pasture and alfalfa lands is accomplished principally by wild flooding. Much of the return water is recaptured and used on lower pasture lands. Sprinkling systems are used for irrigating some alfalfa and grain lands.

Water is diverted primarily by diversion dams and then conveyed by ditch or canal to the place of use. The largest and longest canal in the area is the Edson-Foulke Yreka Ditch, which has a capacity of about 60 cubic feet per second and a length of about 15 miles. Water is also supplied into ditch systems by pumped diversions. The largest of these belong to three irrigation districts. Several riparian water right owners also use pump diversions.

Many privately owned storage reservoirs exist in the area. Water storage from these reservoirs is used to supplement continuous flow allotments.

The Shasta River decree (see Table 1) provides eight separate areas of distribution within the service area. This decree established the following number of priority classes for these areas: Shasta River above the confluence with Big Springs Creek - 43; Boles Creek - 20; Beaugham Creek - 5; Carrick Creek - 13; Jackson Creek - 7; Parks Creek - 25; Shasta River below the confluence with Big Springs Creek - 29; and Little Shasta River - 7.

Three privately operated water districts within the service area have main diversions which are under supervision of the watermaster. These are: Shasta River Water Users Association, Grenada Irrigation District, and Big Springs Irrigation District. A fourth, the Montague Water Conservation District, stores water in Dwinnell Reservoir for use by the District and by natural flow water right owners immediately below the dam. The watermaster is responsible for diversion to these users.

A number of riparian water users along the Lower Shasta River were not included in the Shasta River decree. Owners of these undefined water rights are therefore not subject to watermaster supervision; consequently, in seasons of short supply these rights can be the cause of many water distribution problems.

1967 Distribution

Watermaster service began April 2 in the Shasta River service area and continued through September 30. Harold B. German, Water Resources Engineering Associate, was watermaster during this period.

The available water supply in the service area was generally above average during the season.

Parks Creek. The flow in Parks Creek was sufficient to supply all allotments (25 priorities) until early July. Some water continued to be diverted into the Yreka Ditch until August 20. The first priority allotments of six cubic feet per second were available for the entire season. Water users downstream from the lowest first priority diversion

received a portion of their allotments during the latter part of the season from return flow and from water rising in the gravel streambed.

Upper Shasta River. The water supply in this area (including Dale and Eddy Creeks), which depends almost entirely on snowmelt runoff, was above average for the season. However, an unusually warm summer caused the minimum runoff occurring in September of 1967 to be less than it was in 1966, a dry season.

During early spring, enough water was available to satisfy all allotments (eight priorities). As the flow decreased, the following levels of priority allotments were met: July 18 - all of fourth priority; July 23 - all of the third priority (Yreka Ditch main allotment); and September 4 (the seasonal low) - 16 percent of the third priority.

Shasta River from Boles Creek to Dwinnell Reservoir. Boles Creek and Shasta River from Boles Creek to Dwinnell Reservoir were operated as one stream, under a long standing oral agreement among the water right owners, with water being distributed on an equal and correlative basis. Adequate water was available to satisfy all allotments until the middle of August. All diversion were then cut to 80 percent. Early in September the flow increased to again allow diversion of 100 percent.

Beaughan Creek. The flow of Beaughan Creek was sufficient to satisfy most demands (five priorities) for the entire season. The creek is routed through a mill pond owned by the International Paper Company whichuses approximately 35 percent of the flow for industrial purposes.

Carrick Creek. The water supply in Carrick Creek was adequate to satisfy all allotments (13 priorities) during the entire irrigation season.

Little Shasta River. Enough water was available in the Little Shasta River to satisfy all fifth priority allotments (seven priorities) until early in July. After that date close regulation became necessary to adequately distribute this priority. The flow continued to decrease to approximately 20 percent of fifth priority allotments by the first week in August. It then stayed constant for the remainder of the season.

The daily mean discharge of Little Shasta River near Montague

is presented in Table 38, page 182. This runoff is augmented by rising water along the river channel, and by substantial inflow from Cleland Springs, a tributary approximately two miles below the stream gaging station. Therefore, considerably more water is usually available for distribution at downstream diversion points than is indicated in the discharge table.

Dwinnell Reservoir. Releases from Dwinnell Reservoir to the Montague Water Conservation District commenced on April 26 and continued into October. Reservoir operation data for the 1967 season are shown in Tables 35 and 36, pages 179 and 180.

By agreement with the Montague Water Conservation District water users on Shasta River below Dwinnell Reservoir received stored water from the reservoir on demand in lieu of their natural flow rights. The agreement allotment totals and the amount delivered to each user this season are shown in the following tabulation:

DELIVERIES TO NATURAL FLOW WATER RIGHT OWNERS
BELOW DWINNELL RESERVOIR - 1967

Name of Water Right Owner	Allotment in Acre-feet	Amount Delivered From Dwinnell Reservoir	
		Acre-feet	% of Allotment
Flying L. Ranch	198	198	100
Frank Ayers	464	464	100
J. N. Taylor	1,200	1,073	89
W. W. Valentine			
Hole-in-the-Ground Ranch	596	0	0
Seldom Seen Ranch	924	702	76
TOTALS	3,382	2,437	72

Big Springs. Due to the late, cold spring, the flow of Big Springs was below normal. This shortage of water and a misunderstanding about the maximum allowable surface elevation of Big Springs Lake, caused some operational problems early in the season.

During July, August, and September the flow in Big Springs increases as snowmelt from higher elevations on Mount Shasta percolates into the ground and reappears as surface flow at Big Springs Lake. As a result, Big Springs Irrigation District, a third priority water right owner, was able to pump its full allotment during August and September.

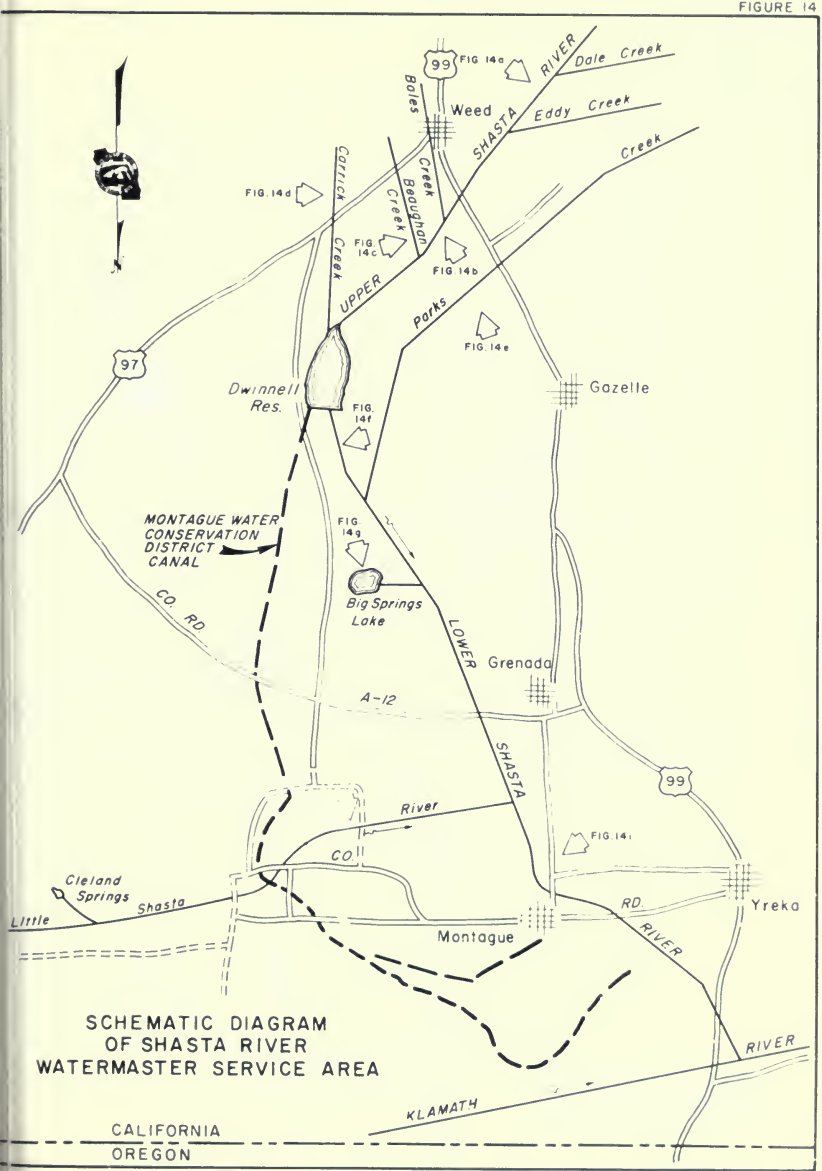
Lower Shasta River. The water supply in Lower Shasta River was sufficient to satisfy all allotments (29 priorities) for the entire season. During the first week in August the flow reached its low for the season at just over 100 percent of allotments. It then increased, providing surplus water for the remainder of the season.

Special Occurrences

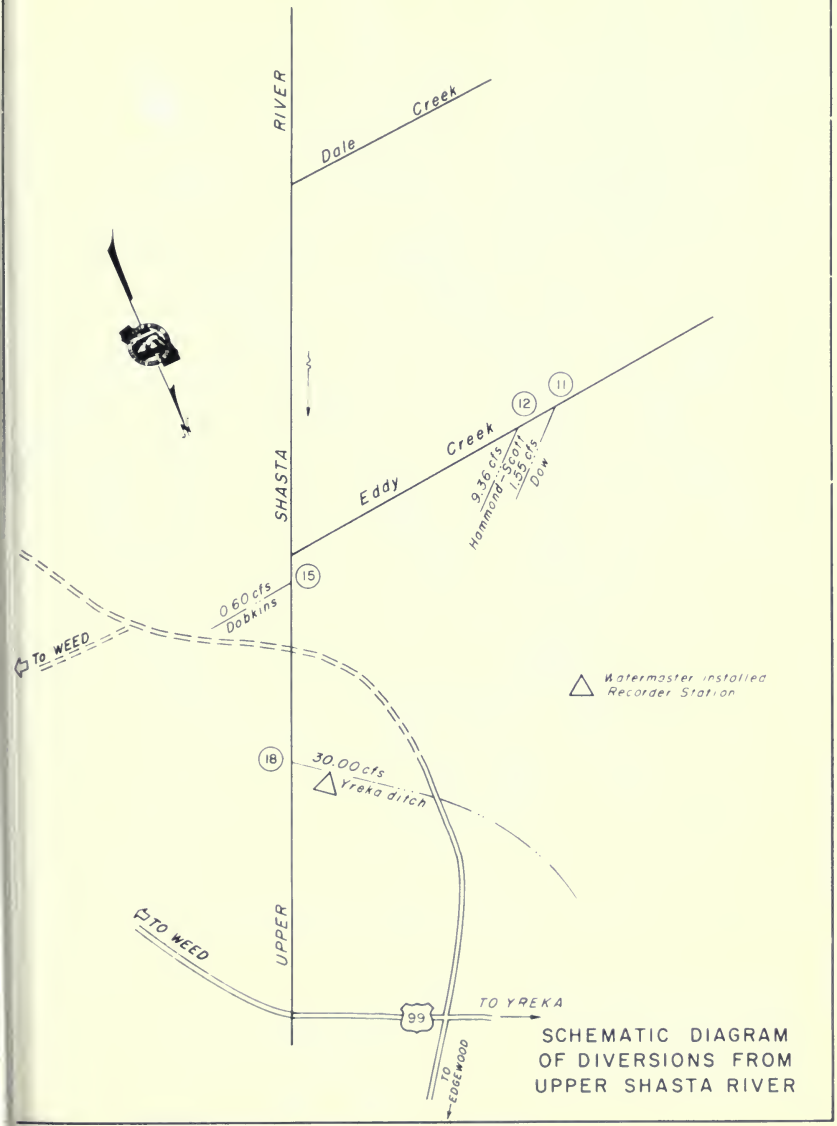
Three water control devices were constructed in the Shasta River service area during the season.

A concrete headwall with a metal screw-type headgate was built in the Dimmick Ditch near its point of diversion from Little Shasta River. A concrete structure, providing a continuous automatic division of water rights, was built in the Hart, Haight, and Prather Ditch which also diverts from Little Shasta River.

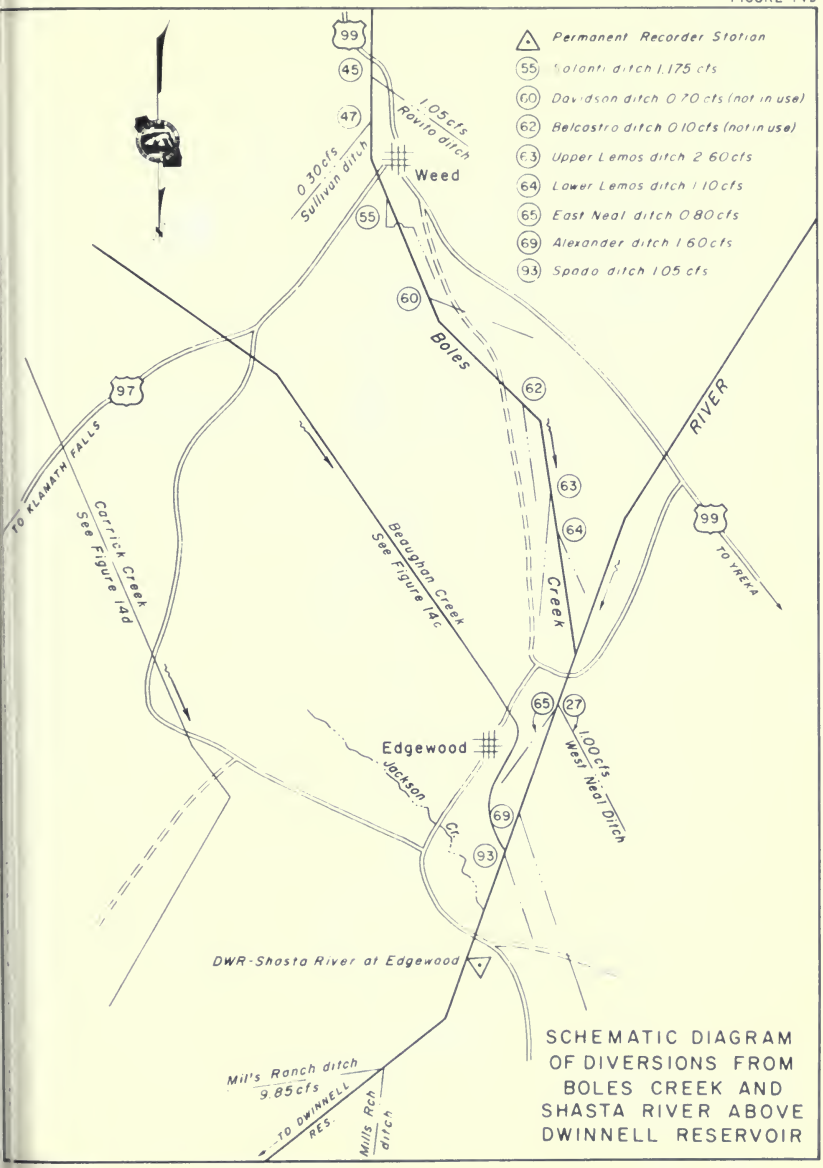
A concrete division structure was built in the Ayers and Hole-in-the-Ground Ranch diversion ditch from Shasta River immediately below Dwinnell Reservoir.



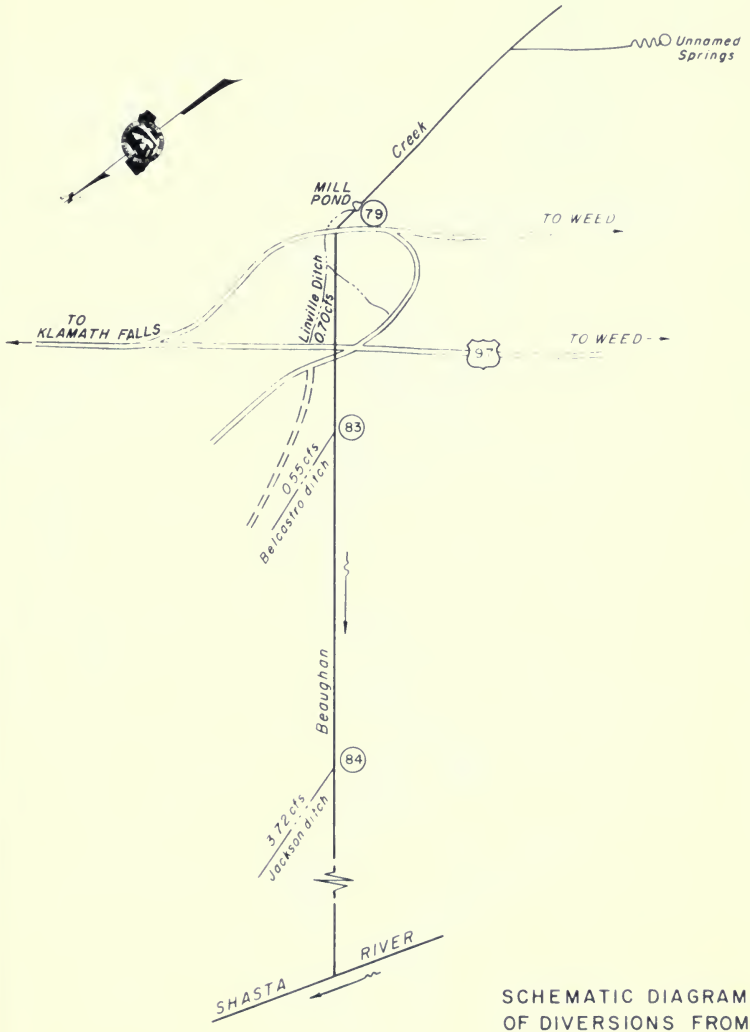
SCHEMATIC DIAGRAM
OF SHASTA RIVER
WATERMASTER SERVICE AREA



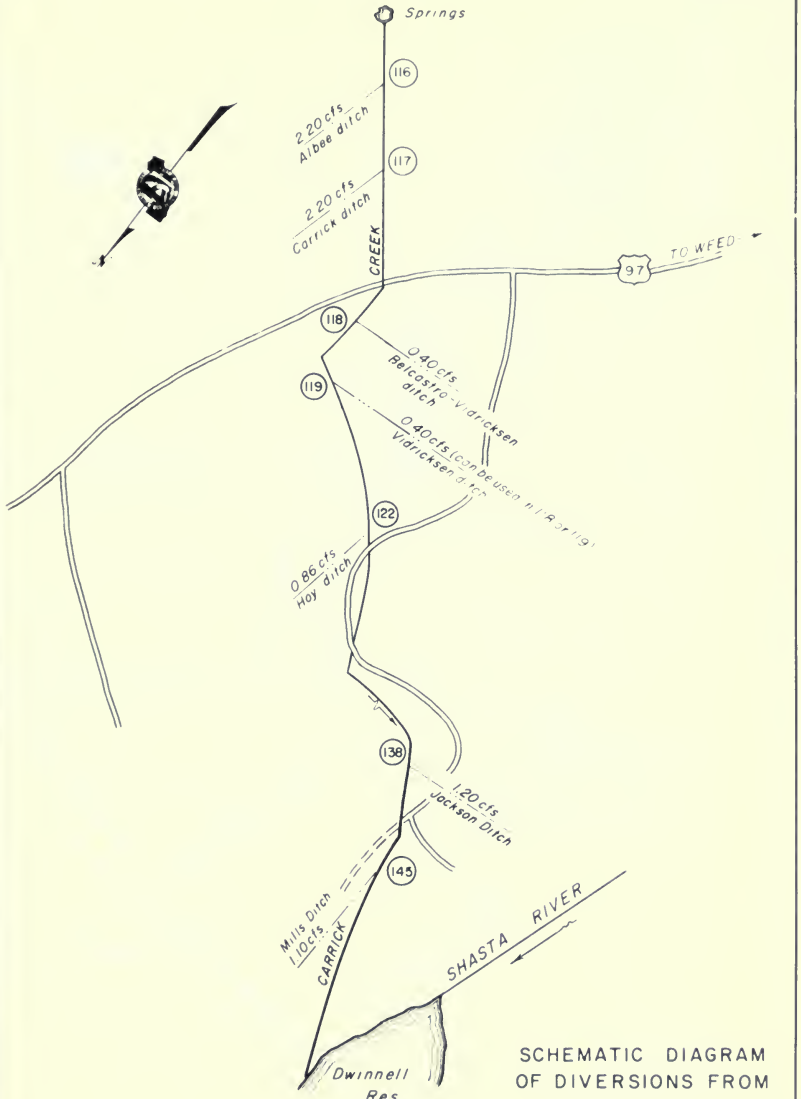
SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
UPPER SHASTA RIVER



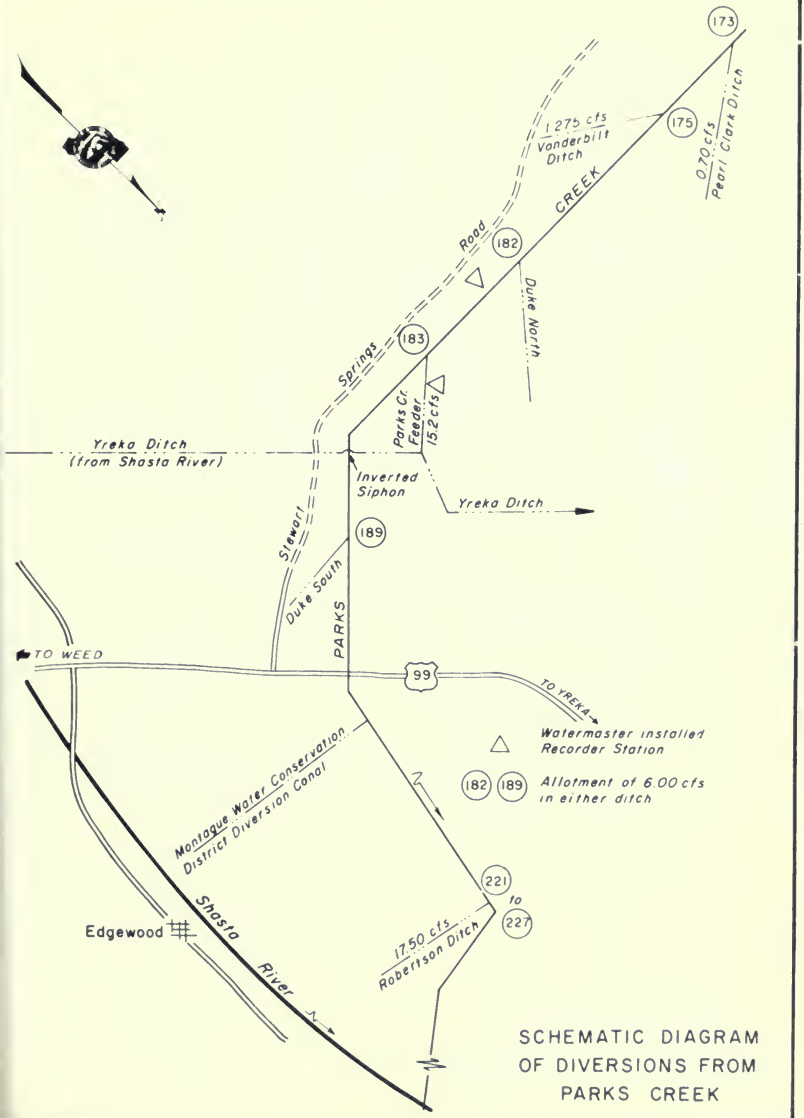
SCHEMATIC DIAGRAM OF DIVERSIONS FROM BOLES CREEK AND SHASTA RIVER ABOVE DWINNELL RESERVOIR

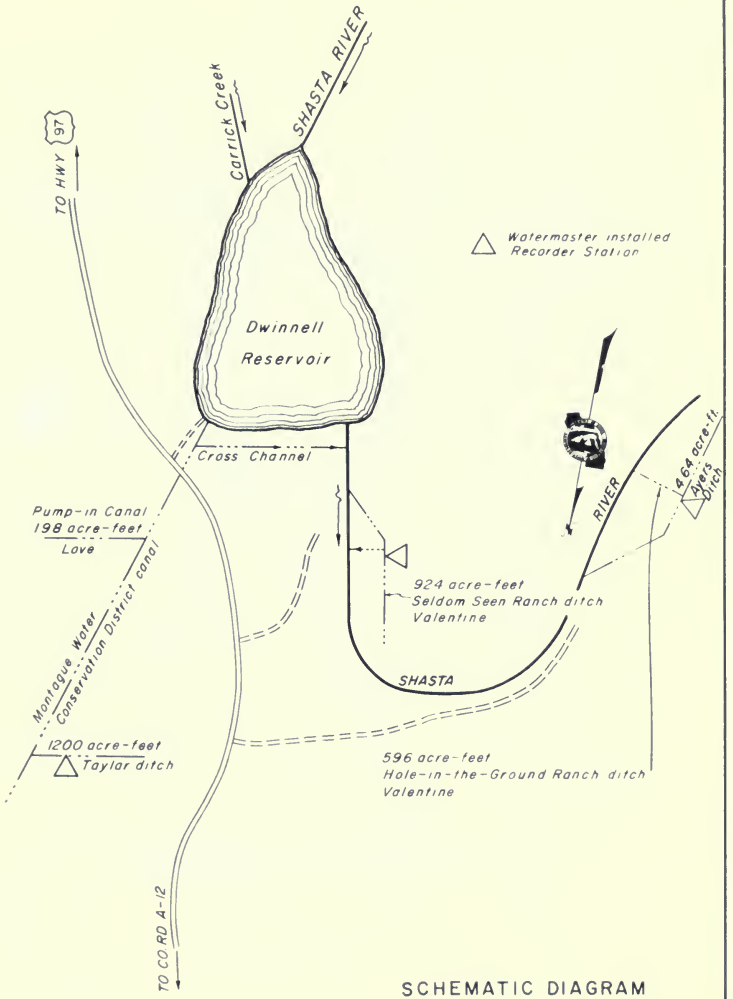


SCHEMATIC DIAGRAM OF DIVERSIONS FROM BEAUGHAN CREEK

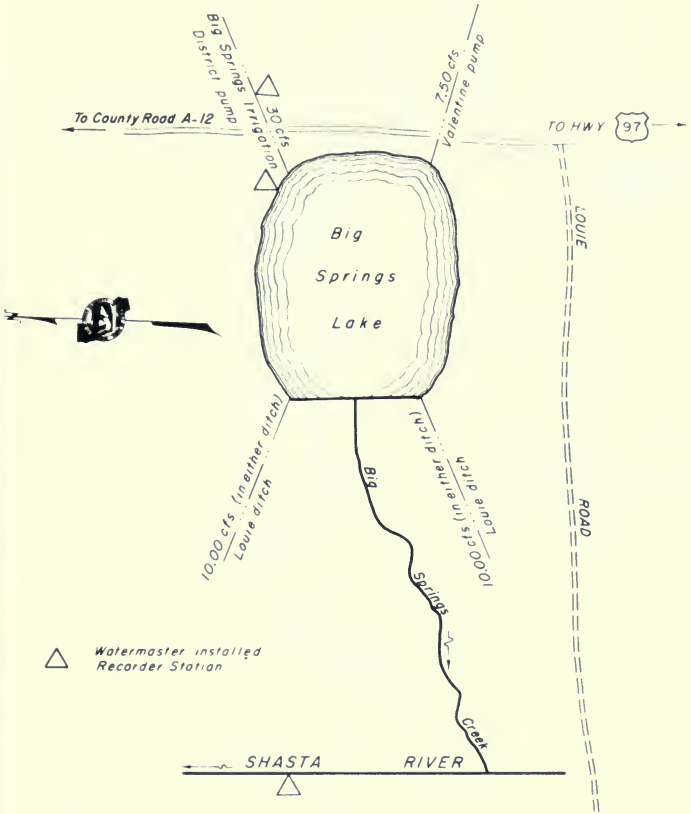


SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
CARRICK CREEK

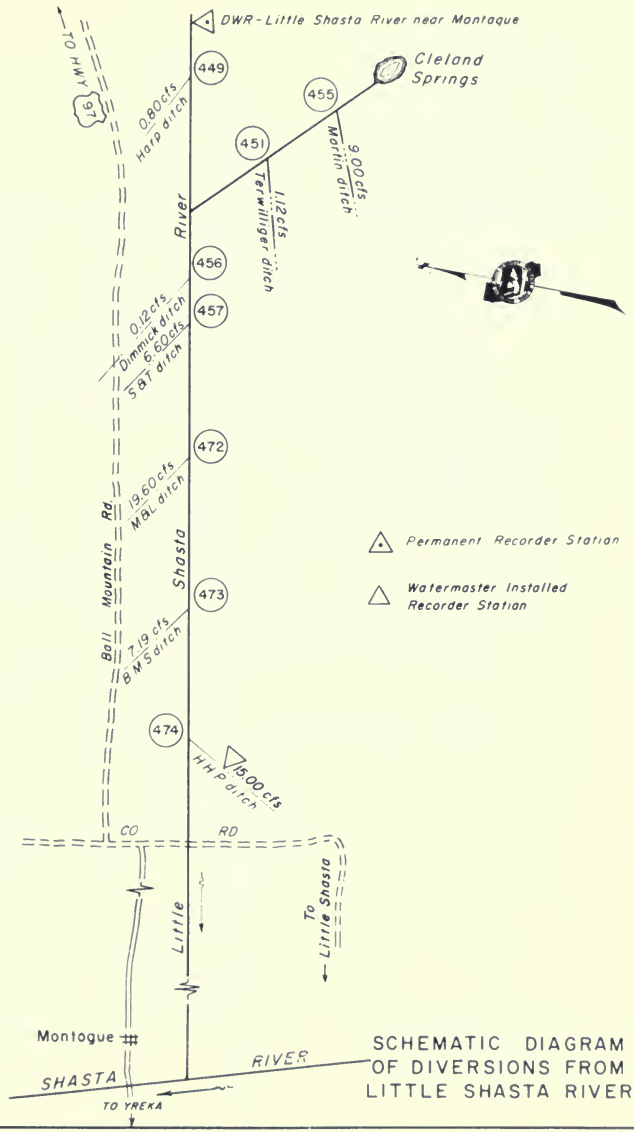

173
175
1,275 cfs
Vanderbilt Ditch
0.70 cfs
Pearl Clark Ditch
CREEK
Road
182
Duke North
Springs
183
Parks Cr. Feeder 15.2 cfs
Yreka Ditch
(from Shasta River)
Inverted Siphon
Yreka Ditch
Stewart
189
Duke South
PARKS
TO WEED
99
TO YREKA
Watermaster installed Recorder Station
182 189 Allotment of 6.00 cfs in either ditch
Montague Water Conservation District Diversion Canal
221
to
227
Edgewood
Shasta River
17.50 cfs
Robertson Ditch
SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
PARKS CREEK



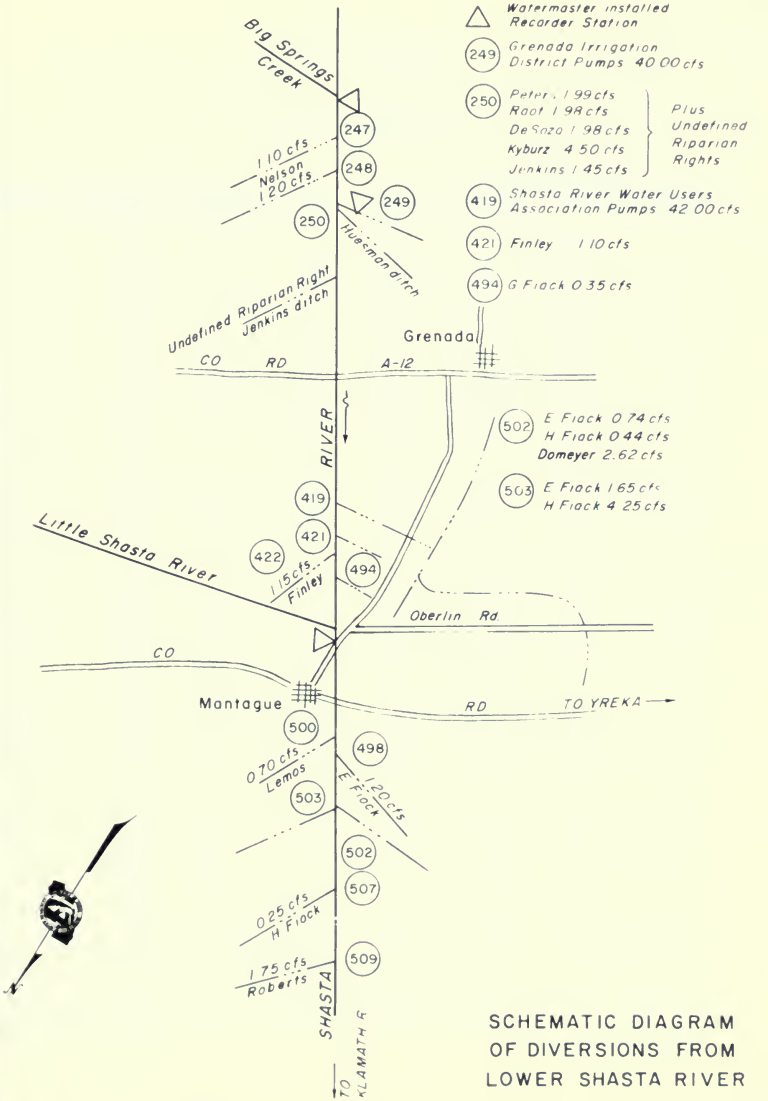
SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
SHASTA RIVER PRIOR RIGHTS
BELOW DWINNELL RESERVOIR



SCHEMATIC DIAGRAM OF DIVERSIONS FROM BIG SPRINGS LAKE



SCHEMATIC DIAGRAM OF DIVERSIONS FROM LITTLE SHASTA RIVER



SCHEMATIC DIAGRAM OF DIVERSIONS FROM LOWER SHASTA RIVER

TABLE 33
DAILY MEAN DISCHARGE

Shasta River at Edgewood

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	67	101	101	202	88	9.4	5.7
2	70	98	101	168	83	9.4	7.0
3	69	94	96	142	76	8.9	6.4
4	66	88	88	142	66	8.5	6.0
5	67	94	94	162	53	8.9	6.7
6	66	147	98	193	46	8.2	6.4
7	62	113	128	230	44	8.2	5.1
8	57	105	217	214	40	7.8	4.6
9	51	101	329	214	38	7.8	4.1
10	78	147	321	205	35	6.0	4.6
11	69	145	230	199	34	6.4	4.3
12	66	126	196	181	28	6.7	5.1
13	66	126	155	162	23	6.7	5.4
14	67	124	160	162	22	7.4	6.0
15	152	157	205	170	20	8.2	5.4
16	1340	150	337	190	20	7.8	5.1
17	467	181	472	205	20	7.8	5.7
18	290	170	488	220	19	7.0	7.8
19	211	170	483	243	18	7.4	7.4
20	211	184	504	230	16	7.0	8.5
21	170	170	583	214	16	7.4	7.4
22	152	181	638	176	16	7.0	7.8
23	170	151	620	135	15	6.7	7.4
24	140	147	499	120	13	6.7	7.4
25	126	140	358	111	13	7.8	7.4
26	115	131	309	109	11	7.0	7.0
27	111	138	253	109	11	8.2	6.7
28	113	120	236	101	10	7.4	6.7
29	111	113	217	94	10	7.0	6.4
30	107	109	190	92	9.4	6.7	6.7
31	107		162		9.4	6.4	
Mean	162	134	286	170	29.8	7.5	6.3
Runoff in acre-feet	9940	7980	17590	10110	1830	464	373

TABLE 34
DAILY MEAN DISCHARGE
PARKS CREEK ABOVE EDSON-FOULKE YREKA DITCH

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1			23	75	43	5.8	2.1
2			25	66	40	5.8	2.1
3			27	66	38	5.6	2.1
4		22*	31	72	35	5.6	2.0
5		22	39	75	32	5.4	2.0
6		23	42	82	30	5.4	2.0
7		22	58	92	28	5.2	2.0
8		23	99	87	26	5.0	2.0
9		23	130	90	23	4.8	2.0
10		24	94	86	17	4.6	2.0
11		23	75	86	14	4.4	2.0
12		23	64	81	13	4.2	2.3
13		24	60	75	12	4.0	4.0
14		23	66	78	12	3.8	4.0
15		24	80	84	10	3.8	4.0
16		23	109	86	10	3.8	4.0
17		25	139	86	10	3.8	4.0
18		26	134	86	9.0	3.8	5.4
19		25	134	87	8.4	3.8	4.6
20		26	139	84	8.1	2.6	4.0
21		26	154	75	8.1	2.4	4.0
22		28	154	66	7.8	2.4	3.8
23		27	159	60	7.2	2.4	3.8
24		27	139	57	6.6	2.4	3.8
25		27	125	56	6.6	2.4	3.6
26		27	114	56	6.6	2.4	3.6
27		27	109	52	6.0	2.4	3.6**
28		26	109	48	6.0	2.3	
29		25	104	47	6.0	2.1	
30		23	89	45	6.0	2.1	
31			80		5.8	2.1	
Mean		24.6	93.7	72.9	16.2	3.8	3.1
Runoff in acre-feet		1320	5760	4340	963	231	168

* Beginning of Record
** End of Record

TABLE 35

DAILY MEAN STORAGE IN DWINNELL RESERVOIR

October 1, 1966 through September 30, 1967 (in acre-feet)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5,530	5,040	12,595	21,500	27,425	30,720	37,050	41,045	46,690	45,160	34,775	25,400
2	5,460	5,075	13,035	21,570	27,725	30,800	37,135	41.045	46,780	44,800	34,415	25,175
3	5,355	5,075	13,640	21,640	27,950	30,800	37,220	41,045	46,870	44,530	34,075	24,875
4	5,250	5,110	14,190	21,710	28,175	30,880	37,305	41,045	46,780	44,350	33,735	24,575
5	5,180	5,145	16,220	21,780	28,400	30,880	37,305	40,960	46,780	44,170	33,395	24,350
6	5,110	5,285	16,765	21,850	28,550	30,960	37,475	40,875	46,780	43,900	33,055	24,050
7	5,005	5,390	17,220	21,850	28,700	30,960	37,560	40,875	46,870	43,540	32,720	23,825
8	4,900	5,460	17,545	21,920	28,850	31,040	37,645	40,960	46,960	43,180	32,400	23,530
9	4,870	5,495	17,675	21,990	28,925	31,040	37,730	41,215	46,960	42,830	32,080	23,250
10	4,840	5,565	17,935	22,060	29,075	31,120	37,900	41,640	46,960	42,490	31,760	23,040
11	4,810	5,680	18,140	22,130	29,225	31,280	37,985	41,895	46,960	42,150	31,440	22,760
12	4,780	5,760	18,350	22,200	29,300	31,360	38,155	42,150	46,960	41,725	31,120	22,550
13	4,780	5,840	18,560	22,270	29,450	31,440	38,240	42,235	46,870	41,385	30,800	22,340
14	4,780	6,000	18,980	22,270	29,600	31,520	38,325	42,320	46,780	41,045	30,480	22,200
15	4,780	6,320	19,260	22,340	29,680	31,600	38,580	42,490	46,690	40,705	30,160	22,060
16	4,780	6,850	19,540	22,410	29,760	32,885	38,750	42,660	46,690	40,365	29,840	21,920
17	4,780	7,210	19,750	22,480	29,920	34,160	38,920	43,000	46,600	40,025	29,525	21,710
18	4,780	7,390	19,890	22,550	30,000	34,670	39,175	43,450	46,600	39,685	29,300	21,570
19	4,780	7,615	20,100	22,620	30,160	35,010	39,430	43,900	46,510	39,345	29,000	21,430
20	4,780	9,100	20,240	22,760	30,240	35,350	39,600	44,350	46,510	38,920	28,850	21,290
21	4,780	10,050	20,380	22,830	30,320	35,605	39,855	44,800	46,600	38,580	28,475	21,150
22	4,810	10,550	20,520	22,970	30,400	35,860	40,110	45,340	46,690	38,240	28,175	21,010
23	4,810	10,900	20,660	23,110	30,400	36,030	40,280	45,880	46,690	37,900	27,950	20,800
24	4,840	11,150	20,800	23,180	30,480	36,200	40,450	46,330	46,690	37,560	27,650	20,660
25	4,870	11,350	20,870	23,320	30,500	36,370	40,535	46,510	46,600	37,220	27,350	20,520
26	4,870	11,500	21,010	23,390	30,640	36,455	40,620	46,690	46,510	36,880	27,125	20,380
27	4,900	11,700	21,150	23,600	30,640	36,540	40,705	46,780	46,330	36,455	26,900	20,310
28	4,900	11,850	21,220	24,200	30,720	36,710	40,875	46,780	46,060	36,115	26,600	20,170
29	4,935	12,050	21,290	25,400		36,795	40,960	46,780	45,790	35,775	26,300	20,030
30	4,970	12,265	21,360	26,150		36,880	41,045	46,690	45,520	35,435	26,000	19,890
31	5,005		22,430	26,900		36,965		46,000	45,340	35,095	25,700	

TABLE 36
DAILY MEAN RELEASES
DWINNELL RESERVOIR
April through October 1967
(In second-feet)

Day	April	May	June	July	August	September	October
1		15	64	87	100	95	49
2		27	54	91	100	96	41
3		27	49	101	100	93	27
4		30	47	101	98	90	24
5		32	46	100	96	90	17
6		34	45	100	96	88	16
7		34	47	100	95	89	16
8		38	46	100	96	89	16
9		45	49	100	98	89	16
10		34	57	100	97	89	16
11		29	65	99	96	89	16
12		26	67	99	94	85	16
13		26	68	99	94	75	16
14		27	71	99	94	67	16
15		28	74	100	94	64	16
16		33	76	96	96	59	16
17		49	81	96	97	57	18
18		51	81	96	97	49	24
19		57	82	98	97	54	24
20		57	83	98	85	60	18
21		62	71	97	89	61	9.0
22		66	56	96	93	60	9.0
23		70	37	96	93	60	8.0
24		70	37	96	93	53	8.0
25	0.0 *	72	40	98	93	54	4.0**
26	11	72	53	100	93	57	
27	23	72	60	96	91	54	
28	0.0	72	69	101	91	49	
29	0.0	74	81	101	91	48	
30	0.0	79	88	101	90	48	
31		73		101	93		
Mean	17.0	47.8	61.5	98.2	94.5	70.4	18.2
Runoff in acre-feet	67	2940	3660	6040	5810	4190	904

* Beginning of record
** End of record

TABLE 37
DAILY MEAN DISCHARGE

LITTLE SHASTA RIVER NEAR MONTAGUE

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	16	18	38	118	20	8.6	5.9
2	16	21	50	100	19	8.6	5.9
3	13	23	56	99	18	8.2	5.9
4	10	20	67	83	18	8.6	5.9
5	12	20	69	79	18	8.6	5.9
6	12	21	74	76	17	8.6	5.9
7	14	21	97	72	16	8.6	5.9
8	16	23	126	67	16	8.2	5.5
9	18	25	169	65	16	8.2	5.5
10	12	26	151	61	15	7.8	5.5
11	9.7	22	117	56	15	7.8	5.5
12	15	21	102	54	14	7.8	5.5
13	14	25	97	51	14	7.4	5.5
14	14	24	105	47	13	7.4	5.2
15	15	28	125	45	13	7.4	5.2
16	73	23	133	43	12	7.0	5.2
17	86	22	134	40	13	7.0	5.2
18	62	22	131	38	12	7.4	5.5
19	40	25	133	39	12	7.4	5.9
20	47	25	129	36	12	7.4	5.5
21	52	28	129	36	12	7.0	5.5
22	51	32	131	34	11	7.0	5.2
23	54	29	133	30	11	7.0	4.5
24	37	31	128	29	11	7.0	4.5
25	29	36	123	27	11	7.0	4.5
26	25	28	118	26	10	7.0	4.5
27	24	32	117	24	9.8	7.0	4.5
28	23	31	114	24	9.8	7.0	4.5
29	21	27	106	22	9.4	6.6	4.5
30	18	27	97	21	9.0	6.2	4.5
31	18		90		9.0	6.2	
Mean	28	25	110	51.4	13.5	7.5	5.3
Runoff in acre-feet	1720	1500	6760	3060	829	462	315

TABLE 38
DAILY MEAN DISCHARGE

SHASTA RIVER AT MONTAGUE-GRENADA HIGHWAY BRIDGE

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1			138	178	55	34	31
2			138	264	51	30	31
3			144	232	37	25	39
4			119	192	35	14	42
5			113	171	37	16	43
6			107	161	39	17	46
7			113	167	37	21	46
8			144	168	37	25	31
9			256	167	39	23	37
10			304	157	39	23	56
11			296	138	33	37	59
12			304	107	37	41	61
13			256	89	38	28	66
14			185	89	35	32	64
15			171	83	43	32	66
16			171	79	41	32	74
17			171	79	46	31	72
18			178	72	37	29	79
19		272*	178	75	40	30	56
20		264	185	119	51	23	44
21		240	178	171	32	30	61
22		216	178	131	37	23	131
23		200	164	119	23	23	121
24		171	157	107	28	51	125
25		157	144	74	28	46	107
26		151	125	77	28	31	74
27		151	119	69	30	28	103**
28		164	119	69	30	32	
29		164	119	56	32	40	
30		157	119	51	32	37	
31			119		34	51	
Mean		192	168	124	36.8	30.2	65.4
Runoff in acre-feet		4580	10340	7360	2260	1850	3500

* Beginning of Record
** End of Record

TABLE 39
DAILY MEAN DISCHARGE

SHASTA RIVER NEAR YREKA

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	177	231	196	230	66	33	52
2	177	219	187	385	61	32	37
3	168	219	196	351	48	25	37
4	159	201	164	279	47	22	44
5	159	201	151	228	47	16	42
6	159	208	146	208	46	16	42
7	159	215	153	202	44	14	46
8	147	212	181	200	39	16	41
9	144	194	336	196	36	24	35
10	173	165	455	189	43	26	49
11	232	124	440	168	41	22	61
12	287	118	471	123	39	45	65
13	292	105	391	105	36	28	70
14	295	98	290	100	33	26	75
15	279	114	240	98	41	33	73
16	380	153	247	92	37	30	78
17	651	194	223	92	35	28	77
18	580	323	240	80	42	26	94
19	400	394	238	83	36	20	82
20	358	384	245	122	53	30	55
21	335	353	240	371	37	22	57
22	314	311	242	195	37	26	108
23	303	295	218	151	30	19	122
24	290	271	198	134	21	17	119
25	275	221	176	96	33	49	121
26	264	219	154	85	26	39	78
27	259	215	132	79	24	37	95
28	251	234	149	87	28	34	115
29	255	239	152	74	20	35	112
30	251	219	152	62	25	44	97
31	239		150		29	43	
Mean	271	222	231	162	38.4	28.6	72.3
Runoff in acre-feet	16680	13190	14190	9650	2360	1760	4300

South Fork Pit River Watermaster Service Area

The South Fork Pit River service area is located primarily in Modoc County with a small portion extending into the northern part of Lassen County. There are 37 water right owners in the area with total allotments of 350.97 cubic feet per second.

Water supply for this service area is obtained from the South Fork Pit River and its tributaries which rise on the western slopes of the Warner Mountains. The river flows in a westerly direction, entering South Fork Valley near Likely. It then flows north through the valley to its confluence with the North Fork Pit River at Alturas. The South Fork Pit River is joined from the east by Fitzhugh Creek near the middle of the valley and by Pine Creek just south of Alturas.

The major area of water use is in South Fork Valley between Likely and Alturas. South Fork Valley is about 16 miles long and 3 miles wide with the valley floor lying at an elevation of about 4,500 feet. The valley is bounded on both sides by a rocky plateau that separates it from the surrounding mountains.

A schematic drawing of each major stream system within the South Fork Pit River service area is presented as Figures 15 through 15d, pages 189 through 197.

Water Supply

The water supply for Pine Creek is derived mostly from snowmelt runoff. Therefore, runoff is usually small in the early spring, increases to a peak in May as temperatures rise, and then gradually decreases throughout the remainder of the season. Water users supplement their irrigation supplies from other sources whenever possible.

The water supply for Fitzhugh Creek consists of snowmelt runoff early in the season and supplemental water diverted from Mill Creek above Jess Valley later in the season. Surplus water from Fitzhugh Creek is diverted into the Payne and French Reservoirs through

Payne-French Ditch (Diversion 136) until about June, when the diversion is closed to supply downstream allotments. By July the creek has normally receded until only first priority allotments are available.

Payne Ditch (Diversion 1) is opened to import water from Mill Creek to Fitzhugh Creek when the snow has melted enough to allow access. This imported water is rediverted from North Fork Fitzhugh Creek through the Bowman Ditch to the Bowman Ranch. Return flow from Bowman Ranch to the creek is rediverted through diversion 136 for stockwatering purposes in the Payne-French Ditch.

The water supply for the South Fork Pit River is derived primarily from snowmelt runoff, supplemented by water released from West Valley Reservoir. A number of streams, which rise at high elevations, collect at the mouth of Jess Valley to form the South Fork Pit River. West Valley Reservoir is located on West Valley Creek which enters the river below Jess Valley.

Most of the water users on the South Fork Pit River, except those in Jess Valley, are in the South Fork Irigation District. The district stores water in West Valley Reservoir, which has a capacity of 22,240 acre-feet, and releases it to the South Fork Pit River as a supplemental supply when the natural flow becomes insufficient to meet demands. This usually occurs during the middle of June. Reservoir releases, together with the natural flow, are distributed by the watermaster in cooperation with the Board of Directors of the irrigation district. Except for extremely dry years natural flow, combined with stored water, is sufficient to supply all demands for water on the South Fork Pit River throughout the irrigation season.

Records of the daily mean discharge of the several stream gaging stations in the area are presented in Tables 40 through 43, pages 199 through 202.

Methods of Distribution

Irrigation of the lands along tributary stream is accomplished by flooding through use of small lateral ditches. The water is distributed on a continuous-flow basis to each user through gravity

flow diversion systems. In some cases, rotation is practiced among several users.

Most irrigation in the South Fork Pit River area is by the check and border method. The lands receive water essentially on demand by supplementing natural flow with releases from West Valley Reservoir. However, irrigation between the various ranches must be coordinated to eliminate large peak demands from the reservoir and to use the return flow as much as possible. Actual distribution varies each year as there is no specific irrigation schedule in use.

The South Fork Pit River decree and the Pine Creek Agreement (see Table 1) establish a two-priority class system of distribution for the Fitzhugh Creek and Pine Creek stream systems. Distribution to the South Fork Pit River users (the decree provides for a two-priority class system) is carried out on an equal and correlative basis in accordance with the water requirements for each ranch. This method of operation was made possible by construction of West Valley Reservoir in 1937.

1967 Distribution

Watermaster service began April 1 in the South Fork Pit River service area and continued until September 30. George H. Pape, Associate Engineer, Water Resources, was watermaster during this period.

The water supply for the 1967 irrigation season was well above average. Cold weather and late storms maintained a near record snowpack in the Warner Moutains until late in the spring. The extremely hot and dry summer, however, caused the flow of the smaller tributaries to fall off to only average amounts by late summer.

Pine Creek. Due to cold weather and the resulting low runoff, very close regulation was required during April and early May. Flow increased to over 100 percent of all allotments (2 priorities) by late May and remained fairly steady throughout June. Since the Modoc Refuge did not use its full allotment during some of this time, excess water was diverted for storage in Dorris Reservoir. As the flow decreased in the latter part of the season, those water users with more than one ditch followed their usual practice of rotating their allotments in

their various ditches. Flow had decreased to approximately 50 percent of first priority allotments by the end of the season.

Fitzhugh Creek. Regulation began in late May when the Yankee Jim and Bowman Ditches became accessible. At that time there was more water than required to fill all allotments (2 priorities). The Payne Ditch from Mill Creek was opened on June 30. This additional water was added to the Bowman Ditch allotment. Flows gradually decreased from surplus to approximately 60 percent of first priority allotments at the end of the season.

South Fork Pit River. The natural flow of the South Fork Pit River was sufficient to meet all demands until July 14, at which time releases from West Valley Reservoir began.

Storage in the reservoir increased from 12,200 acre-feet at the beginning of the season, until its capacity of 22,240 acre-feet was reached on June 3. Water was released continuously from the reservoir for the rest of the season. At the end of September, 12,400 acre-feet remained in storage.

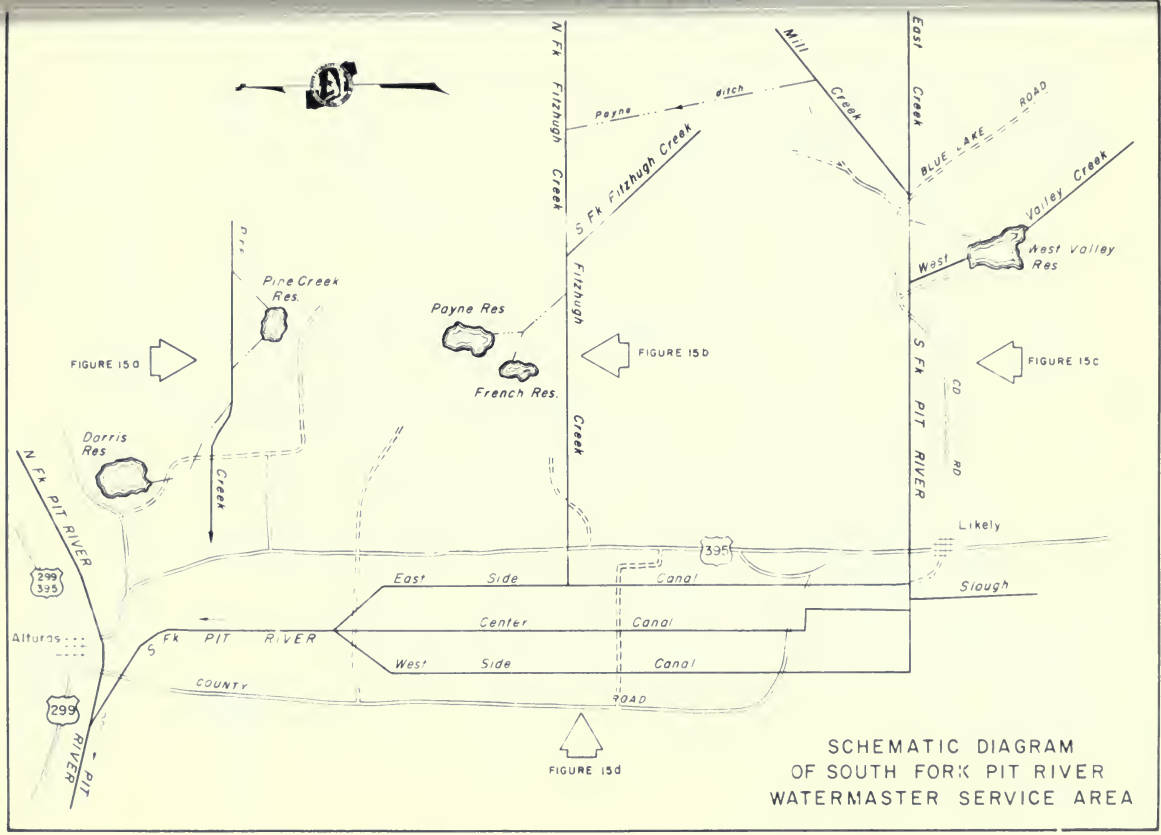
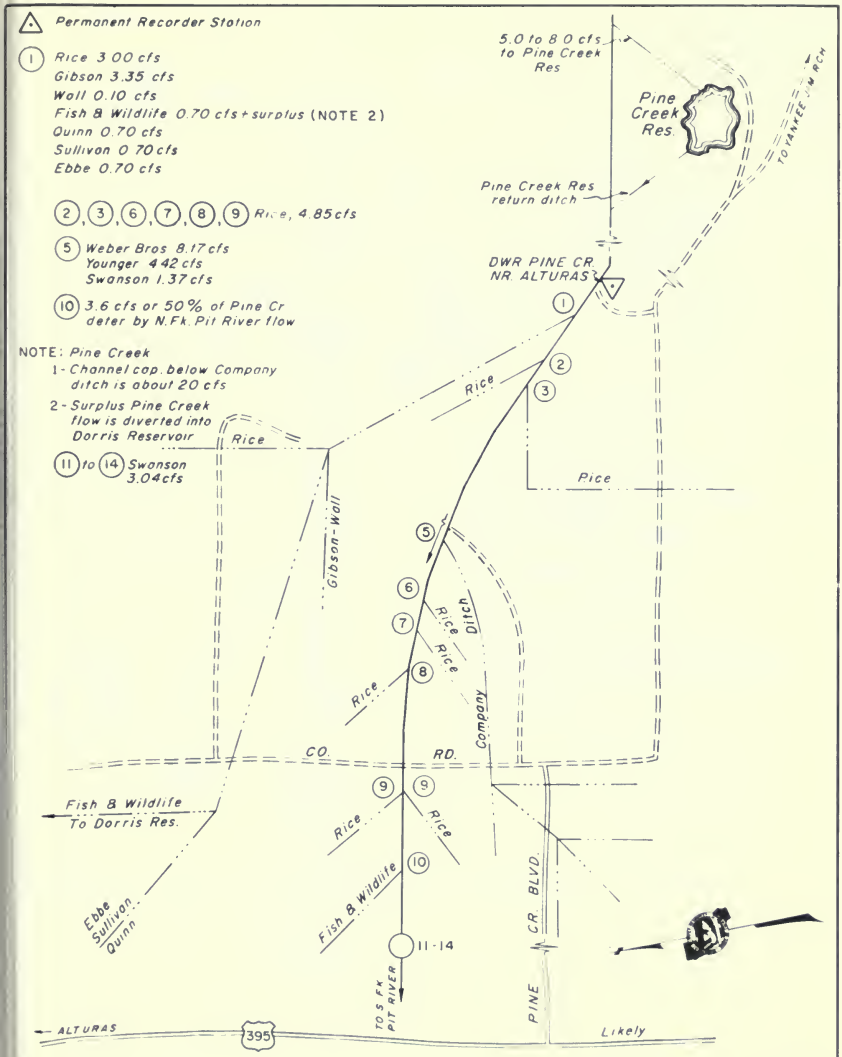
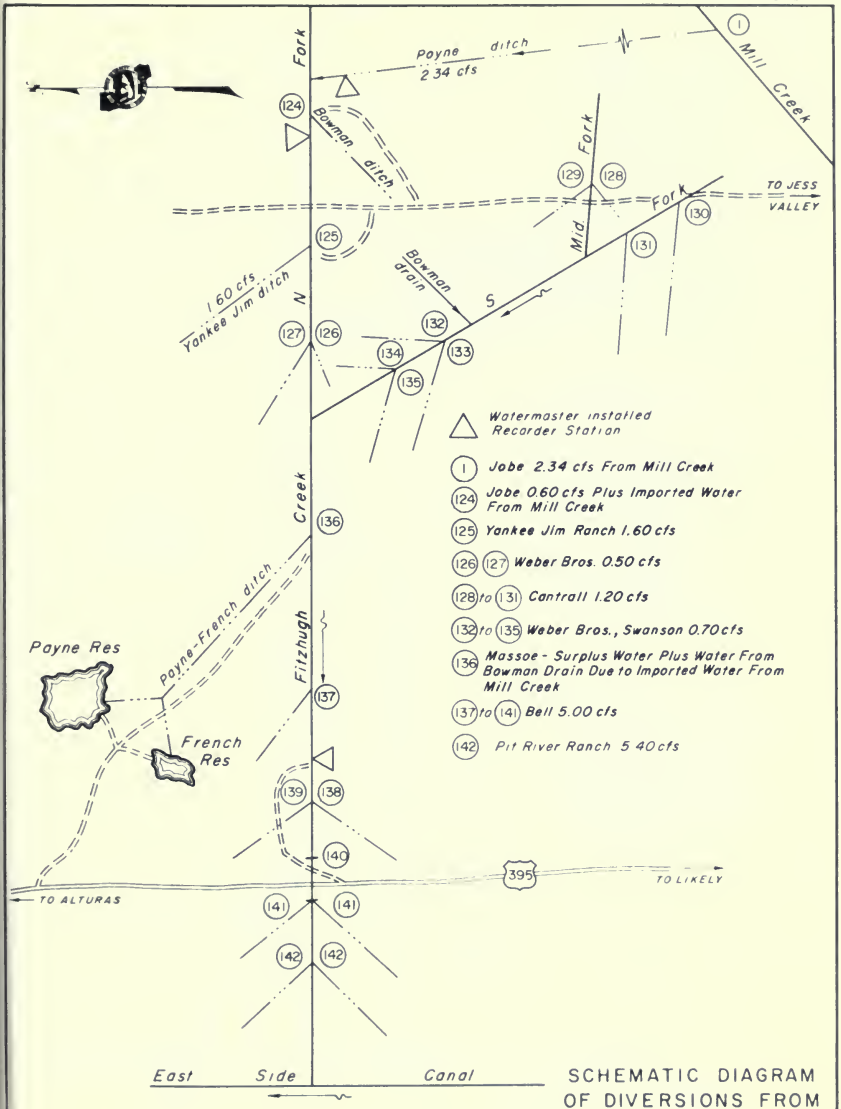

N Fk Fitzhugh Creek
Mill Creek
East Creek
Payne ditch
BLUE LAKE ROAD
S Fk Fitzhugh Creek
Fitzhugh Creek
Valley Creek
West Valley Res
Pine Creek Res.
Payne Res
French Res.
Dorris Res
FIGURE 15a
FIGURE 15b
FIGURE 15c
FIGURE 15d
S FK PIT RIVER
CO RD
N FK PIT RIVER
Likely
299
395
East Side Canal
Slough
Center Canal
Alturas
S Fk PIT RIVER
West Side Canal
COUNTY ROAD
PIT RIVER
SCHEMATIC DIAGRAM
OF SOUTH FORK PIT RIVER
WATERMASTER SERVICE AREA

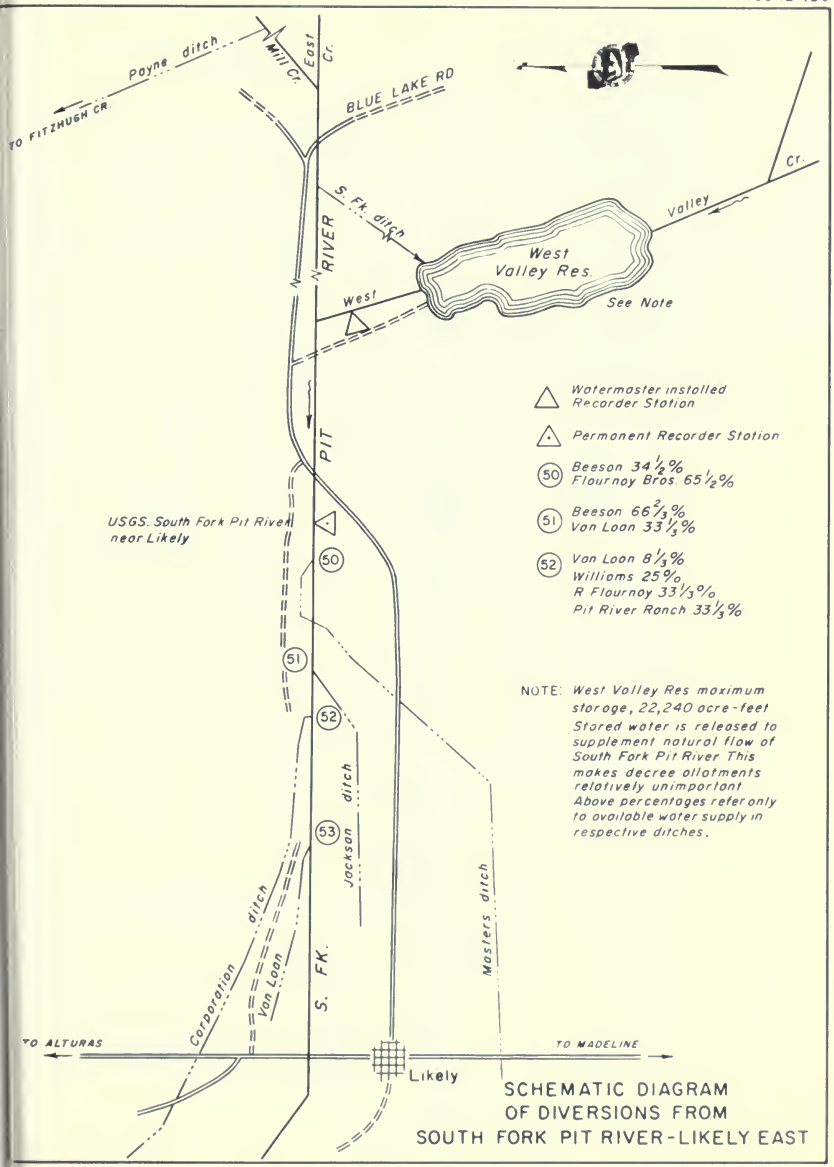
FIGURE 5



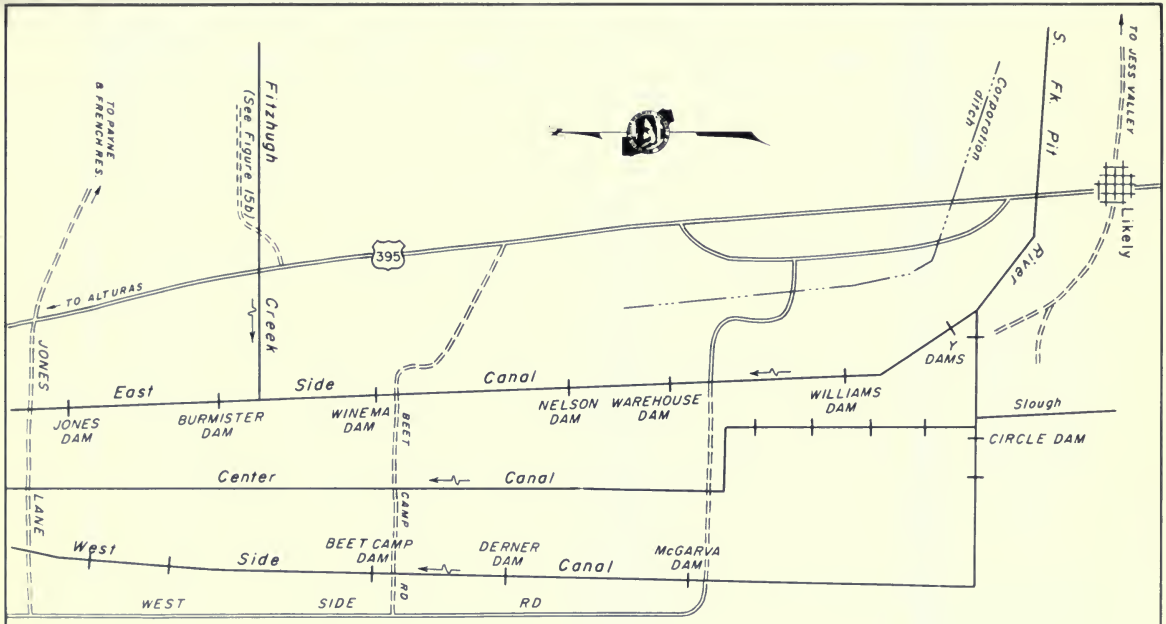
SCHEMATIC DIAGRAM OF DIVERSIONS FROM PINE CREEK



SCHEMATIC DIAGRAM OF DIVERSIONS FROM FITZHUGH CREEK



SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
SOUTH FORK PIT RIVER-LIKELY EAST



SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
SOUTH FORK PIT RIVER-LIKELY NORTH

FIGURE 15d

TABLE 40
DAILY MEAN DISCHARGE

South Fork Pit River near Likely

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11	Data unavailable at time of printing. Will be published in U.S.G.S., "1967 Water Resources Data for California, Part 1-Surface Water Records, Volume 2: Northern Great Basin and Central Valley."						
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
Mean							
Runoff in acre-feet							

TABLE 41
DAILY MEAN DISCHARGE
WEST VALLEY CREEK BELOW WEST VALLEY RESERVOIR
March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1					40	65	185
2					35	65	183
3				1.0*	31	70	183
4				10	26	100	181
5				33	21	98	132
6				94	19	98	60
7				116	18	95	40
8				126	18	95	31
9				135	12	92	15
10				140	10	114	63
11				143	9.4	130	62
12				143	8.3	130	62
13				135	7.5	128	62
14				130	19	128	61
15				116	34	128	61
16				106	32	128	61
17				100	32	128	61
18				93	32	128	38
19				88	32	128	28
20				69	32	128	28
21				62	32	104	27
22				62	32	100	27
23				61	32	100	27
24				60	32	100	26
25				59	32	104	26
26				58	32	144	26
27				58	32	144	25
28				51	32	144	25**
29				47	32	176	
30				45	32	188	
31					60	185	
Mean				84	27	118	64
Runoff in acre-feet				4640	1680	7270	3580

* Beginning of Record
** End of Record

TABLE 42
DAILY MEAN DISCHARGE
Fitzhugh Creek below Diversion No. 137
March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12			NO RECORD AVAILABLE				
13							
14			FOR 1967 SEASON				
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
Mean							
Runoff in acre-feet							

TABLE 43
DAILY MEAN DISCHARGE
PINE CREEK NEAR ALTURAS

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	8.4	10	22	76	46	18	12
2	8.4	9.7	21	68	45	18	12
3	7.9	9.7	15	64	44	18	12
4	8.7	9.7	12	67	42	17	13
5	9.7	10	13	78	40	17	13
6	8.7	10	13	90	39	17	13
7	8.7	11	17	77	38	16	12
8	8.7	23	22	73	36	16	12
9	8.7	15	27	76	34	16	12
10	8.7	11	27	78	33	16	12
11	8.9	10	27	81	30	16	12
12	8.7	10	24	79	29	15	12
13	9.7	10	20	76	29	15	11
14	9.2	10	20	73	28	15	11
15	8.4	11	25	69	28	15	11
16	10	11	31	65	28	15	11
17	12	10	37	65	27	15	11
18	10	11	43	66	26	15	12
19	10	12	47	67	25	15	12
20	10	12	49	67	24	15	11
21	9.7	9.4	52	67	23	14	11
22	9.7	12	62	66	22	14	11
23	10	11	77	74	22	14	10
24	10	12	90	60	21	13	11
25	9.7	26	96	56	20	14	11
26	9.7	27	96	52	20	14	11
27	9.7	26	94	50	19	14	11
28	9.7	34	92	48	19	13	10
29	8.7	24	90	48	19	13	10
30	10	20	85	47	18	13	11
31	10		81		18	12	
Mean	9.4	14.2	46.0	67.4	28.8	15.1	11.5
Runoff in acre-feet	576	848	2830	4010	1770	928	682

Surprise Valley Watermaster Service Area

The Surprise Valley service area is located in the extreme eastern part of Modoc County. There are 170 water right owners in the service area with total allotments of 313.75 cubic feet per second. The source of water supply is comprised of 10 individual stream systemsrising on the eastern slope of the Warner Mountains. These streams are fed by snowmelt runoff and traverse a fast precipitous course down the eastern slope of the Warner Mountains to the valley floor. From that point, numerous, scattered diversion ditches convey water to the irrigated lands. The place of use is situated in a long, narrow area extending in a north-south direction between the foot of the Warner Mountains and the Alkali Lakes which lie in the center of Surprise Valley.

Surprise Valley extends from nearly the Oregon border on the north to Lassen County on the south, a distance of approximately 50 miles. The valley varies in width from about 8 to 10 miles. It is bordered on the north, south, and west by the rugged Warner Range and on the east by the typical mountainous desert terrain of Nevada. The valley floor is at an elevation of approximately 4,700 feet.

A schematic drawing of each major stream system within the Surprise Valley service area is presented as Figures 16 through 16j, pages 211 through 231.

Water Supply

The water supply is derived almost entirely from snowmelt runoff, with only minor spring-fed flows occurring in the latter part of the season. There are no known economically justified storage sites on the service area creeks. Because of the lack of regulatory storage, the available water supply at any specific diversion point may vary considerably within a few hours. An extreme differential in day and night temperatures causes extensive variation in snowmelt runoff quantities. This problem is further aggravated by the relatively

short and steep drainage area. In addition, occasional summer thunder showers may cause a creek to discharge a flow of mammoth portions for several hours. These flashes are apt to cause considerable damage in washouts and debris deposition, and are of such short duration that no beneficial use can be made of the water.

Records of the daily mean discharge at several stream gaging stations within the service area are presented in Tables 44 through 54, pages 233 through 243.

Method of Distribution

The continuous flow method of distribution is employed on most creeks; however, in a few instances the available water supply is rotated among the users in accordance with either decree schedules or by mutual agreements.

Alfalfa and meadow hay, the major crops grown in the valley, are irrigated in most instances by wild flooding. There are also considerable lands dependent upon subsurface irrigation. In addition, recent development of numerous deep wells has popularized sprinkler irrigation. This type of irrigation, however, is limited because of available ground water supply and costs of installation and maintenance.

To facilitate distribution of irrigation waters, construction of permanent diversion dams, headgates, and measuring devices has been stressed during recent years. Although these control devices do not solve the problems of discharge variation and debris deposition, they do provide significant assistance in solving water measurement and distribution problems.

The several decrees (see Table 1) which apply to the Surprise Valley service area establish the following number of priority classes for the various stream systems: Bidwell Creek - four until July 10, five thereafter; Mill Creek - four; Soldier Creek - rotation March 19 to June 19 (upper users eight, lower users seven), twelve priorities are in effect during the remainder of the year; Pine Creek - a rotation schedule based on accumulative flow in acre-feet is used; Cedar Creek - four; Deep Creek - five; Owl Creek - twenty-one; Rader Creek - six;

Eagle Creek - four; and Emerson Creek - four.

1967 Distribution

Watermaster service began March 19 in the Surprise Valley service area and continued until September 30. John A. Nolan, Water Resources Technician II, was watermaster during this period.

The 1967 irrigation season was very successful despite only average seasonal runoff in most streams, and considerably below average in a few whose headwaters are at relatively low elevations.

The snowpack on the Warner Mountains was well below normal at the beginning of the irrigation season. Frequent snowstorms and low temperatures during April and May, however, brought the snowpack to normal or above during the latter part of spring. Due to a fairly constant rate of snowmelt the runoff was sufficient to supply most allotments through the first half of the irrigation season. This produced an excellent yield for the first hay cuttings throughout the valley. Enough water remained in most creeks to begin irrigation for a second growth of hay. In most years only a few high priority water right owners can expect this additional water in July. However, the flows began to recede quickly during July, and by late September were essentially down to domestic and stockwater rights.

The seasonal runoff (April 1 through September 30) of the various streams ranged between 60 and 130 percent of the long-time averages.

Bidwell Creek. Total stream runoff available to Bidwell Creek users during the period from April 1 through September 30 was 15,560 acre-feet or approximately 130 percent of normal (based on records since 1955).

Due to a good snowpack in the Bidwell Creek basin there was enough runoff to supply all allotments until mid-June (four priorities until July 10, five priorities thereafter). From then until July 10 only third priority allotments were supplied. Bidwell Creek then receded at a fairly constant rate, reaching a low of approximately four cubic feet per second in late September. This was enough water to supply only first

priority allotments.

Mill Creek. Total stream runoff available to Mill Creek users during the period April 1 through September 30 was 5,550 acre-feet or approximately 100 percent of normal.

An abundant water supply existed throughout April, May, and most of June with much of the surplus flow wasting into Upper Alkali Lake. On June 29 the flow became insufficient to supply all allotments (four priorities). From then until late July, third priority water was available in steadily decreasing quantities. Second priority allotments were shut off in late August. Throughout the remainder of the season the available water supply was generally sufficient to satisfy the first priority allotments.

Soldier Creek. Total stream runoff available to Soldier Creek users during the period March 19 through September 30 was 2,130 acre-feet or approximately 60 percent of normal.

All diversions were closely regulated during the rotation periods (March 19 to June 19) as the water supply was inadequate to satisfy all allotments (eight priorities during the upper users' cycle, seven priorities during the lower users' cycle) until mid-May. At this time the stream runoff increased to provide surplus flows which lasted approximately ten days. In early June the flow began decreasing at a fairly constant rate. Partial second priority allotments were satisfied through early August. When the seasonal low was reached in late September, only partial first priority allotments were being served.

Pine Creek. Total stream runoff available to Pine Creek users during the period March 20 through September 30 was 1,410 acre-feet or approximately 100 percent of normal. The stream system was operated according to the rotation schedule (an accumulative flow basis) set forth by court decree.

On June 14 the flow dropped below four cubic feet per second, thereby ending the rotation schedule. The Alderman and Hutchens Ranches were then entitled to take all of the flow until it further receded to 1.6 cubic feet per second. This occurred on June 19. In accordance with the decree, the entire flow was then diverted into the Cressler Ditch to be used by the Bordwell Ranch. This diversion continued for about three

weeks, or as long as the water would reach the place of use. From mid-July until the end of the season Pine Creek was essentially dry.

Cedar Creek. Total stream runoff available to Cedar Creek users during the period April 1 through September 30 was about 2,410 acre-feet or approximately 80 percent of normal.

There was a sufficient water supply to satisfy all allotments (four priorities) until mid-May. Third priority allotments were satisfied through the end of May. Second priority regulation began during the first part of June as the streamflow continued to decline.

The entire flow was diverted to the only first priority water right owner from early July to the end of the season.

Deep Creek. Total stream runoff available to Deep Creek users during the period April 1 through September 30 was 2,420 acre-feet or approximately 65 percent of normal.

The water supply was sufficient to fulfill all third priority allotments (five priorities on the main stem of Deep Creek) until the third week in May. The streamflow then began to steadily recede. From this time until the end of the season the entire flow of North Fork Deep Creek was diverted into the Company Ditch, since only first priority water was available (one priority on North Deep Creek).

Second priority regulation began on the South Fork Deep Creek (two priorities) on June 1 and continued through June 10. Throughout the remainder of the irrigation season water was available for first priority allotments in steadily declining amounts.

Owl Creek. Total stream runoff available to Owl Creek users during the period April 1 through September 30 was 6,460 acre-feet, or approximately 100 percent of normal.

The flood control and distribution project is providing an excellent means of equitable distribution of irrigation waters. During the 1967 season the highest flow recorded in the system was 67 cubic feet per second, which is less than the design capacity of 75 cubic feet per second. The only distribution problem encountered was the usual one of gravel and debris accumulating at the intake, thereby restricting inflows to the system. A routine flushing schedule for the intake works was employed to minimize this problem.

Enough water existed to fulfill all of the 21 priorities until late June. For the remainder of the season the flow receded gradually, reaching a low of approximately one cubic foot per second in late September.

There was sufficient water available to supply all of the "special" eight priority allotments during their respective periods.

Rader Creek. Total stream runoff available to Rader Creek users during the period April 1 through September 30 was 3,190 acre-feet or approximately 95 percent of normal.

The water supply was sufficient to satisfy all allotments (six priorities) until the first of July. As the streamflow began receding, close regulation of all diversions was required to maintain equitable distribution. Diversion Number 1 was closed July 31, 1967, because not enough water was available to reach the place of use. The flow then receded steadily throughout the remainder of the irrigation season. Second priority allotments terminated on August 31 in accordance with the decree. During September, first priority water was available in varying amounts.

Eagle Creek. Total stream runoff available to Eagle Creek users during the period April 1 through September 30 was 3,940 acre-feet or approximately 65 percent of normal.

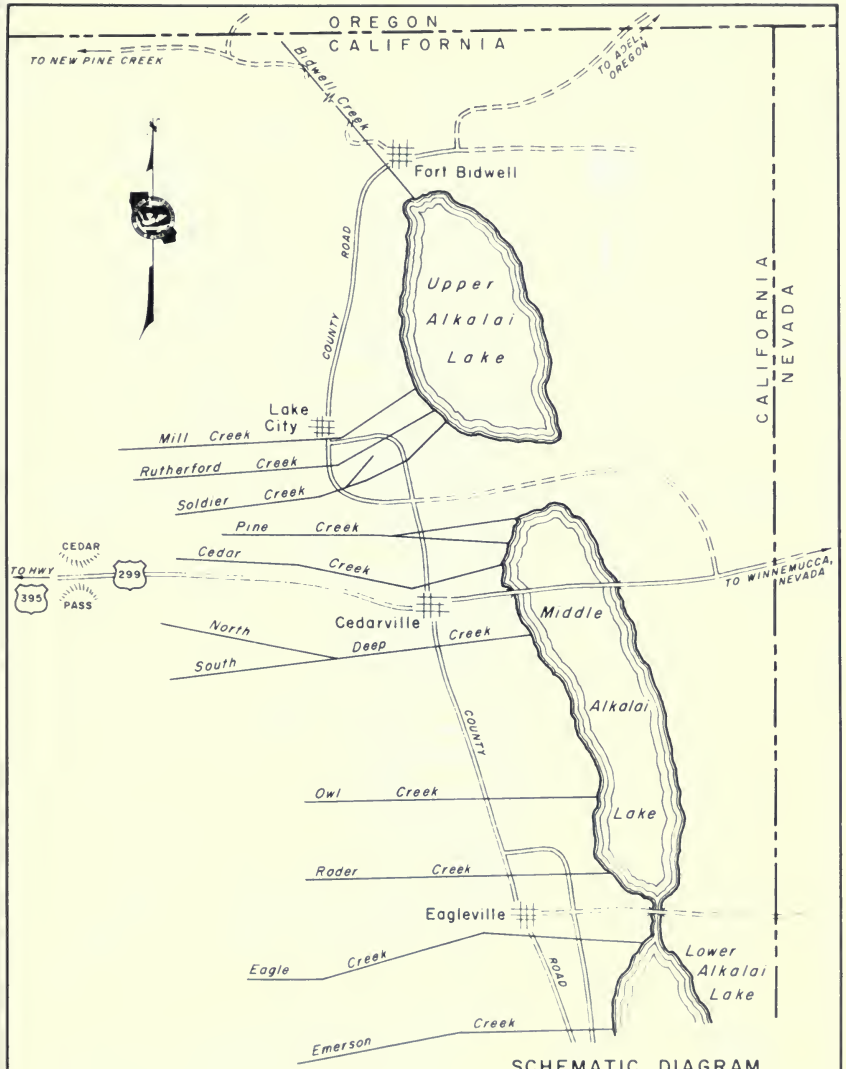
A sufficient water supply was available to satisfy all allotments (four priorities) until early July. Thereafter, the flow steadily receded. As the third priority supply decreased, excessive channel losses prevented any practical distribution in the lower reaches of the creek. In accordance with the decree, under these conditions the Ford Ranch was allowed to divert all third priority water. Second priority allotments were shut off in August. Thereafter, only first priority water was available (stockwater and domestic garden rights).

Emerson Creek. Total stream runoff available to Emerson Creek users during the period April 1 through September 30 was 3,120 acre-feet or approximately 85 percent of normal.

A sufficient water supply existed to satisfy all allotments (four priorities) until approximately the end of May. Fourth priority allotments were then terminated. Third priority allotments were shut

off on June 29 as the creek continued to recede. Throughout the remainder of the season second priority allotments were available in steadily decreasing amounts.

Emerson Creek users again supplemented their second growth irrigation supply by the use of several deep wells.



SCHEMATIC DIAGRAM
OF SURPRISE VALLEY
WATERMASTER SERVICE AREA

Permanent
Recorder Station

March 15 through July 9
(major season of use)

(5) G. Peterson 0.38 cfs
C. Bucher 0.45 cfs
Sweeney 0.07 cfs

(6) Sweeney 0.18 cfs

(7) G Peterson 0.50 cfs

(8) McConnaughy 7.24 cfs *
Town Users 0.06 cfs

(9) Conlan 7.63 cfs
Town Users 0.22 cfs

(10) Carey 6.13 cfs
C Bucher 0.66 cfs
P. Peterson 0.44 cfs
Town Users 0.30 cfs

(11) C. Bucher 0.38 cfs

(12) U.S. Indian Service 0.46 cfs
Green 0.14 cfs
Baty 0.12 cfs

(13) McConnaughy 5.24 cfs *
Town Users 0.44 cfs

(15) Fee 8.94 cfs
Sagehorn 1.34 cfs
O'Callaghan 2.88 cfs
Taney 0.42 cfs

(17) Kober 0.05 cfs

(20) Sagehorn 0.88 cfs

(19A) (20) (20A) Carey 1.43 cfs

(21) Sagehorn 1.39 cfs

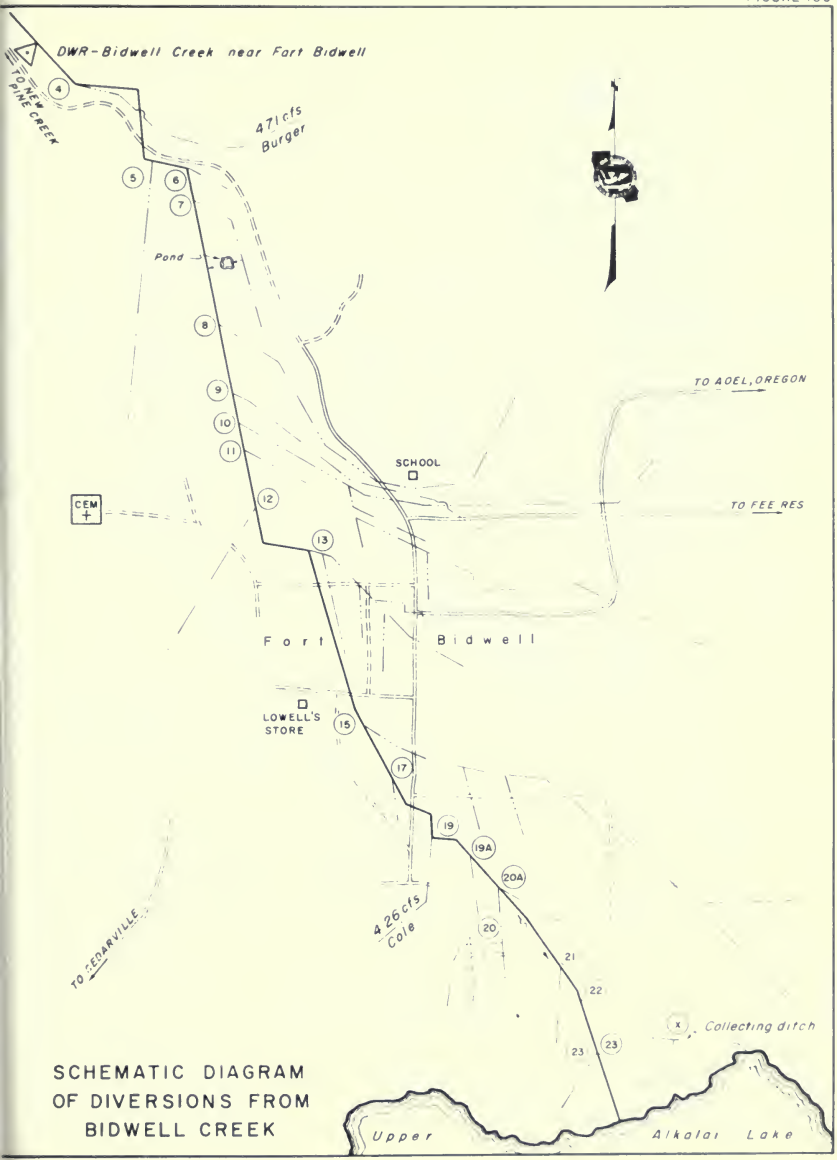
(22) O'Callaghan 0.38 cfs

(23) Sagehorn 1.79 cfs

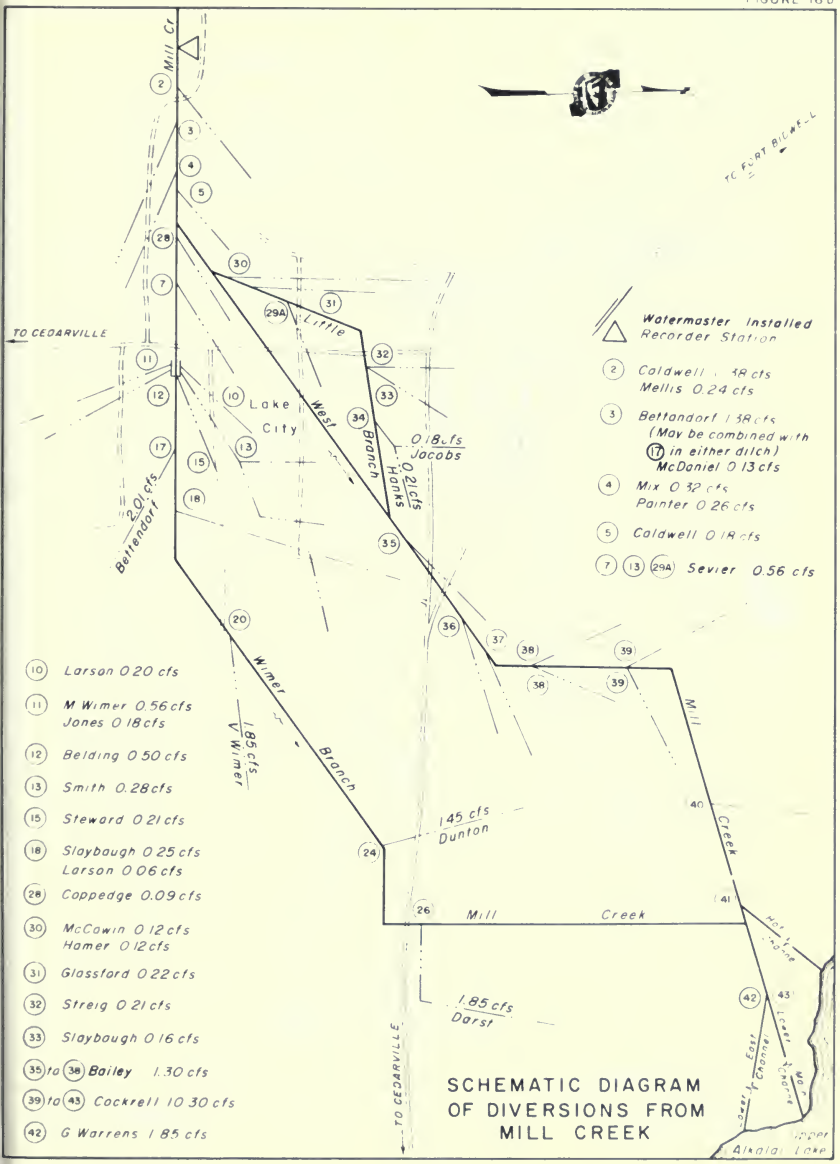
(X) Sagehorn — If flow is less than 3.82 cfs, deficiency is made up by additional diversion through (15) if Fee Ranch allotment is satisfied

* May be used in either ditch

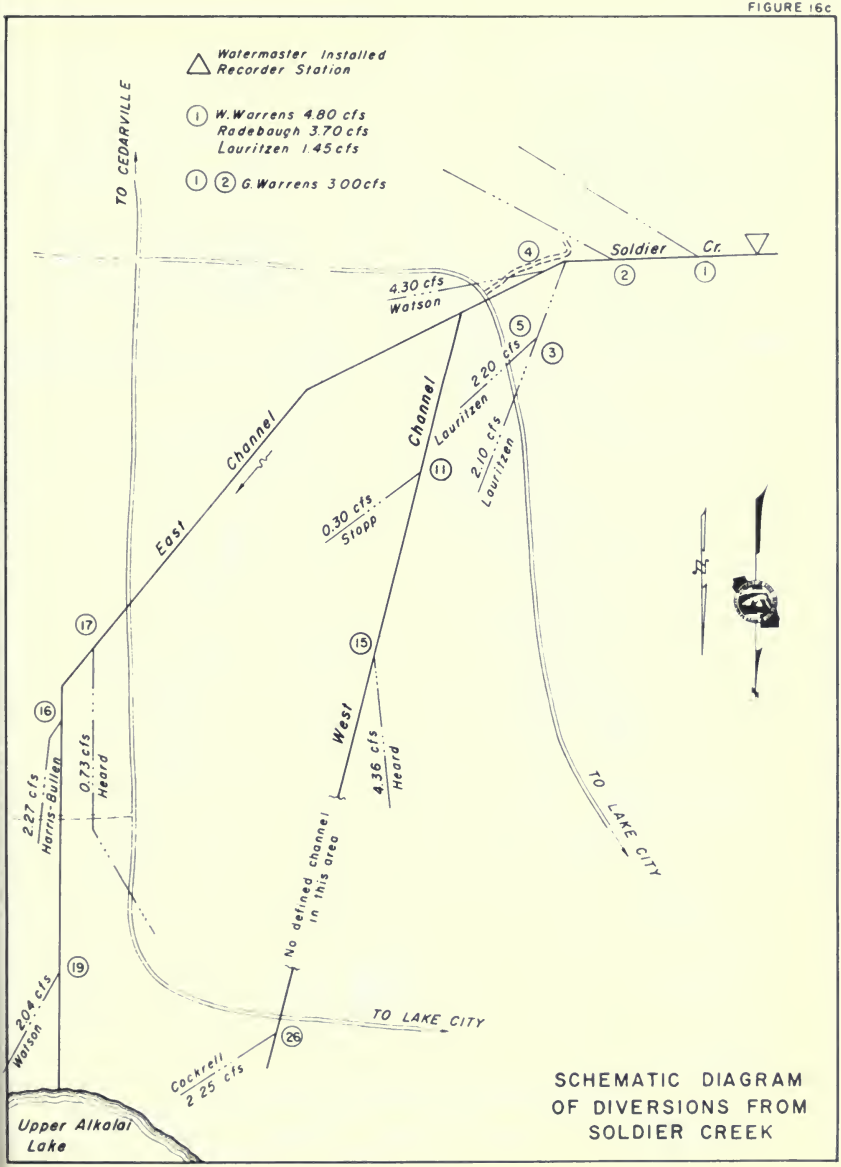
NOTE Sagehorn and O'Callaghan waters may be used in any of their ditches at discretion of user and watermaster



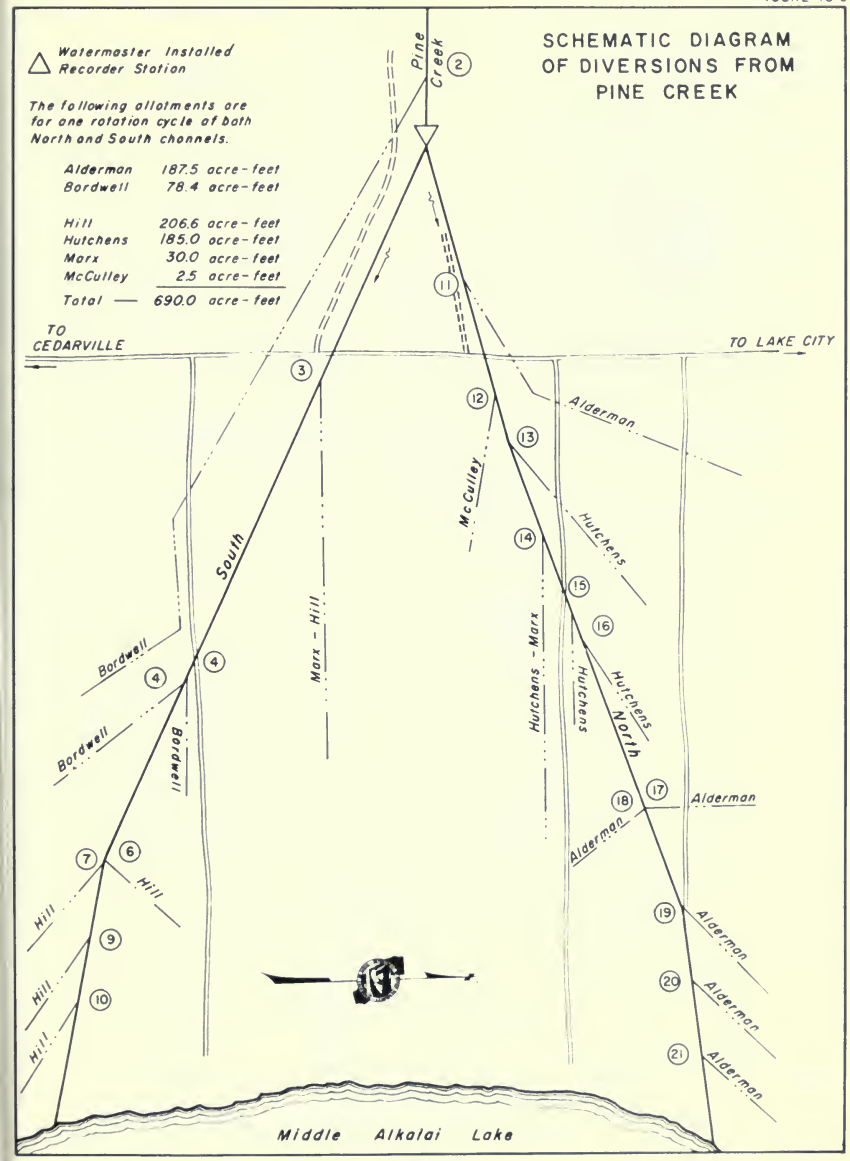
SCHEMATIC DIAGRAM OF DIVERSIONS FROM BIDWELL CREEK

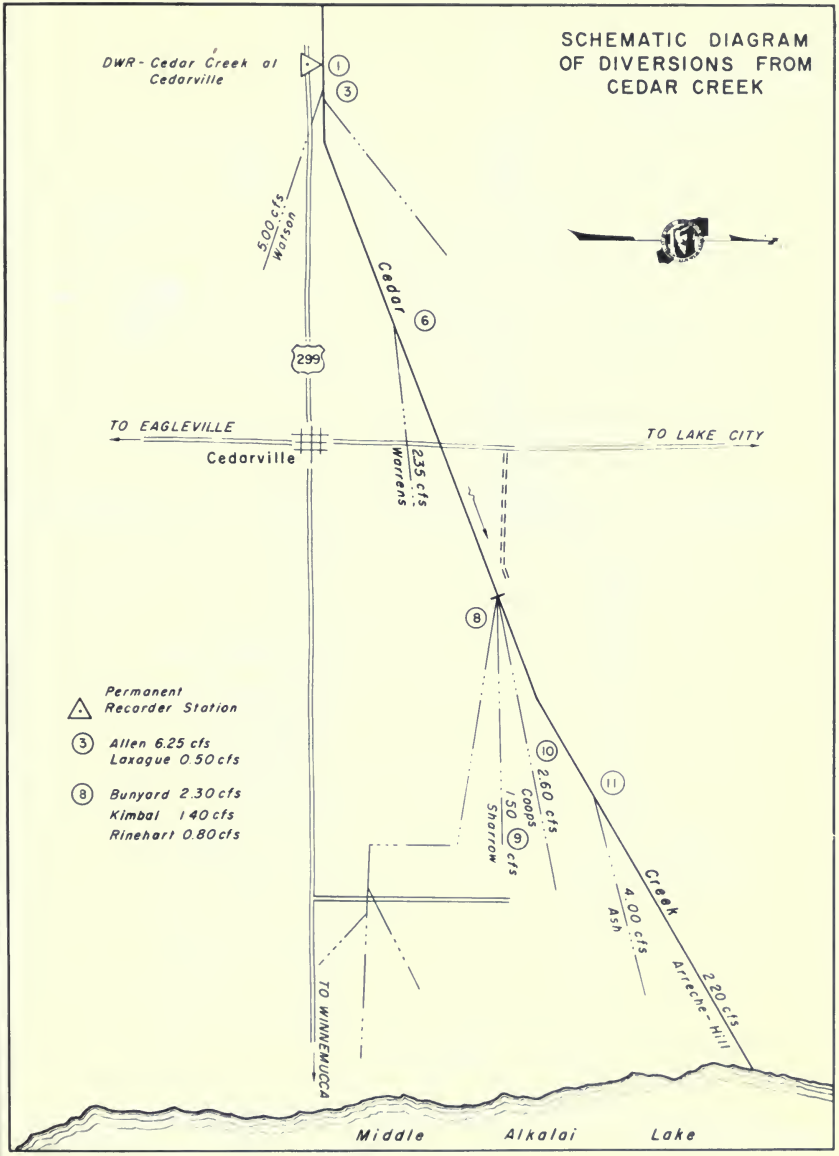


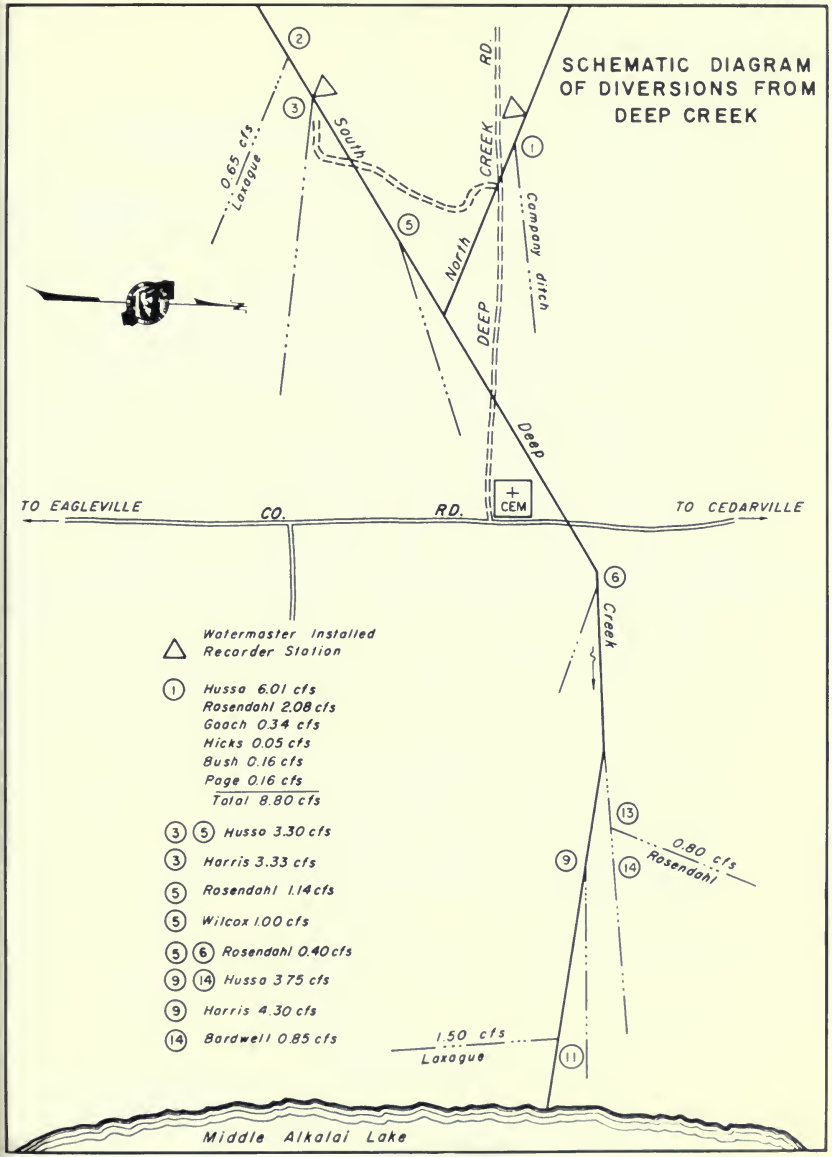
SCHEMATIC DIAGRAM OF DIVERSIONS FROM MILL CREEK

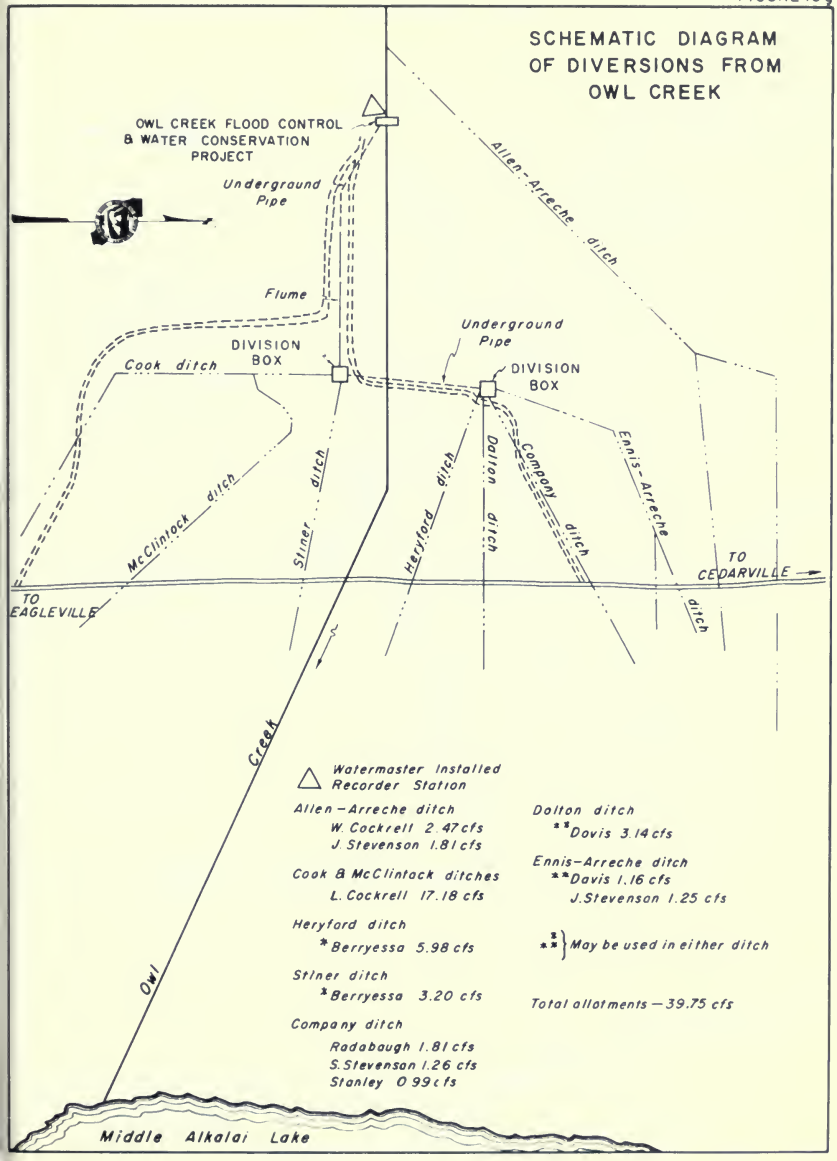


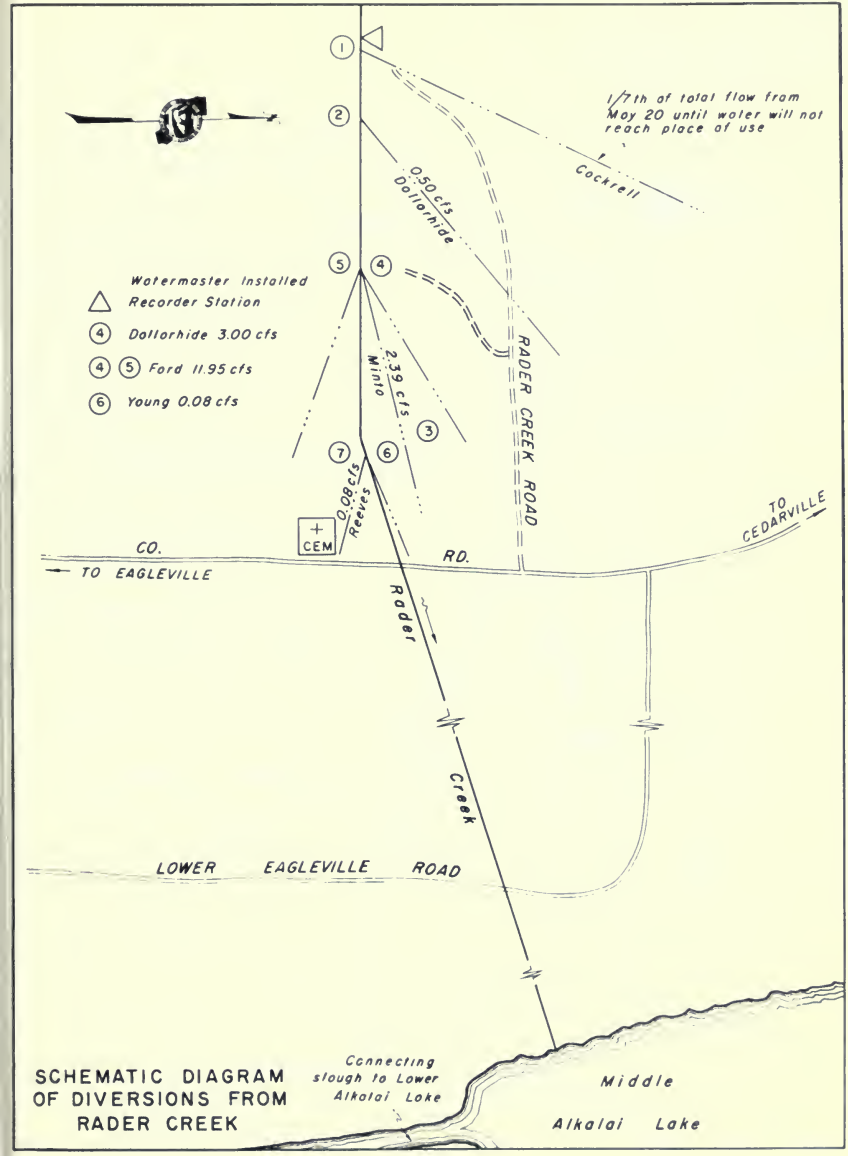
SCHEMATIC DIAGRAM OF DIVERSIONS FROM SOLDIER CREEK


SCHEMATIC DIAGRAM OF DIVERSIONS FROM PINE CREEK
△ Watermaster Installed Recorder Station
The following allotments are for one rotation cycle of both North and South channels.
Alderman 187.5 acre-feet
Bordwell 78.4 acre-feet
Hill 206.6 acre-feet
Hutchens 185.0 acre-feet
Marx 30.0 acre-feet
McCulley 2.5 acre-feet
Total — 690.0 acre-feet
Pine Creek
TO CEDARVILLE
TO LAKE CITY
South
Bordwell
Bordwell
Bordwell
Marx - Hill
McCulley
Alderman
Hutchens
Hutchens - Marx
Hutchens
Hutchens North
Alderman
Alderman
Hill
Hill
Hill
Hill
Alderman
Alderman
Alderman
Middle Alkalai Lake


SCHEMATIC DIAGRAM OF DIVERSIONS FROM CEDAR CREEK
DWR - Cedar Creek at Cedarville
1
3
5.00 c.f.s. Watson
Cedar
6
299
TO EAGLEVILLE
Cedarville
TO LAKE CITY
2.35 c.f.s. Warrens
8
Permanent Recorder Station
3 Allen 6.25 cfs
Laxague 0.50 cfs
8 Bunyard 2.30 cfs
Kimbal 1.40 cfs
Rinehart 0.80 cfs
10
2.60 c.f.s.
Coops
1.50 c.f.s.
Sharrow
9
11
Creek
4.00 c.f.s.
Ash
2.20 c.f.s.
Arrecne - Hill
TO WINNEMUCCA
Middle Alkalai Lake


SCHEMATIC DIAGRAM OF DIVERSIONS FROM DEEP CREEK
RD.
South
CREEK
Company ditch
North
DEEP
Deep
0.65 cfs Laxague
TO EAGLEVILLE
CO.
RD.
CEM
TO CEDARVILLE
Creek
Watermaster Installed Recorder Station
(1) Hussa 6.01 cfs
Rosendahl 2.08 cfs
Gooch 0.34 cfs
Hicks 0.05 cfs
Bush 0.16 cfs
Page 0.16 cfs
Total 8.80 cfs
(3) (5) Hussa 3.30 cfs
(3) Harris 3.33 cfs
(5) Rosendahl 1.14 cfs
(5) Wilcox 1.00 cfs
(5) (6) Rosendahl 0.40 cfs
(9) (14) Hussa 3.75 cfs
(9) Harris 4.30 cfs
(14) Bardwell 0.85 cfs
0.80 cfs Rosendahl
1.50 cfs Laxague
Middle Alkalai Lake


SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
OWL CREEK
OWL CREEK FLOOD CONTROL
& WATER CONSERVATION
PROJECT
Underground
Pipe
Allen-Arreche ditch
Flume
Underground
Pipe
DIVISION
BOX
Cook ditch
DIVISION
BOX
Ennis-Arreche
Company ditch
Dolton ditch
Heryford ditch
Stiner ditch
McClintock ditch
TO
CEDARVILLE
TO
EAGLEVILLE
ditch
Owl Creek
Watermaster Installed
Recorder Station
Allen-Arreche ditch
W. Cockrell 2.47 cfs
J. Stevenson 1.81 cfs
Cook & McClintock ditches
L. Cockrell 17.18 cfs
Heryford ditch
* Berryessa 5.98 cfs
Stiner ditch
* Berryessa 3.20 cfs
Company ditch
Radabaugh 1.81 cfs
S. Stevenson 1.26 cfs
Stanley 0.99 cfs
Dolton ditch
** Davis 3.14 cfs
Ennis-Arreche ditch
** Davis 1.16 cfs
J. Stevenson 1.25 cfs
*, ** } May be used in either ditch
Total allotments — 39.75 cfs
Middle Alkalai Lake



SCHEMATIC DIAGRAM OF DIVERSIONS FROM RADER CREEK

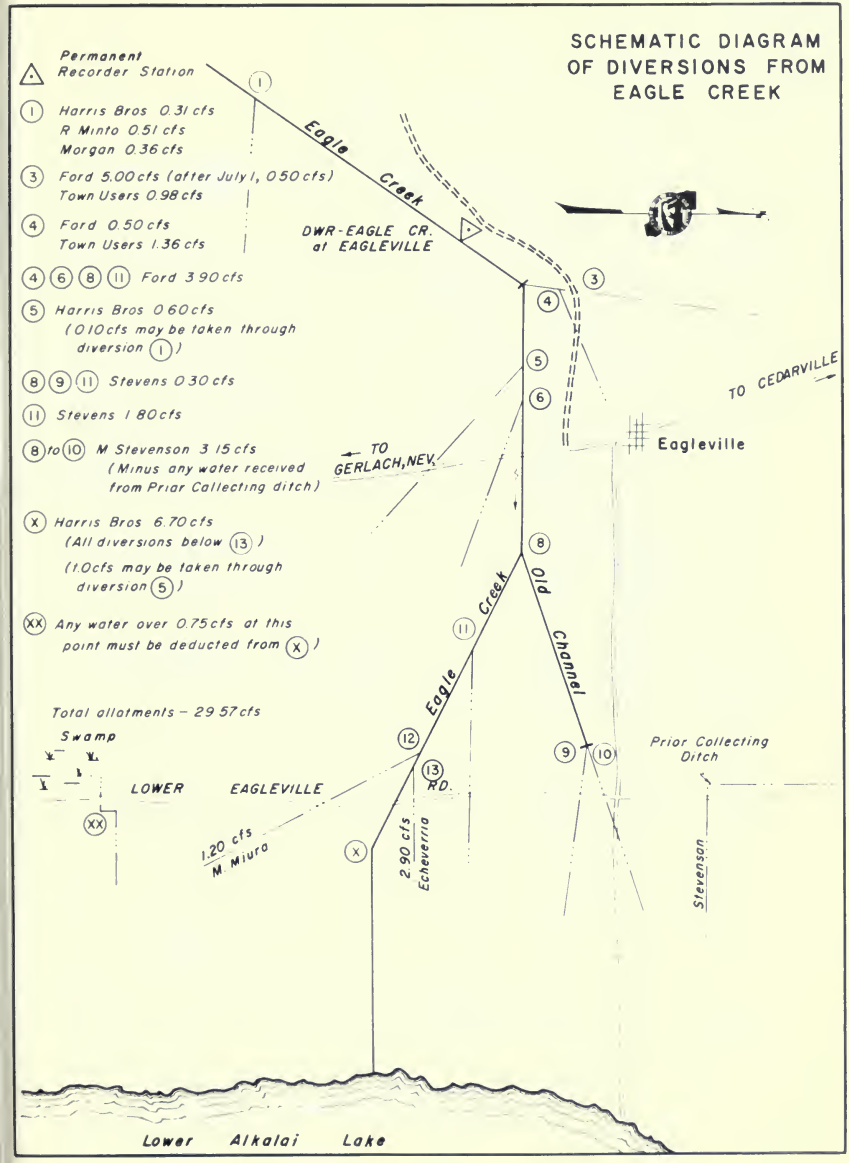

SCHEMATIC DIAGRAM OF DIVERSIONS FROM EAGLE CREEK
Permanent Recorder Station
(1) Harris Bros 0.31 cfs
R Minto 0.51 cfs
Morgan 0.36 cfs
(3) Ford 5.00 cfs (after July 1, 0.50 cfs)
Town Users 0.98 cfs
(4) Ford 0.50 cfs
Town Users 1.36 cfs
(4) (6) (8) (11) Ford 3.90 cfs
(5) Harris Bros 0.60 cfs
(0.10 cfs may be taken through diversion (1))
(8) (9) (11) Stevens 0.30 cfs
(11) Stevens 1.80 cfs
(8) to (10) M Stevenson 3.15 cfs
(Minus any water received from Prior Collecting ditch)
(X) Harris Bros 6.70 cfs
(All diversions below (13))
(1.0 cfs may be taken through diversion (5))
(XX) Any water over 0.75 cfs at this point must be deducted from (X))
Total allotments - 29.57 cfs
Eagle Creek
DWR-EAGLE CR. at EAGLEVILLE
TO GERLACH, NEV.
TO CEDARVILLE
Eagleville
Old Channel
Eagle Creek
Prior Collecting Ditch
Swamp
LOWER EAGLEVILLE RD.
1.20 cfs M. Miura
2.90 cfs Echeverria
Stevenson
Lower Alkalai Lake

FIGURE 16 J

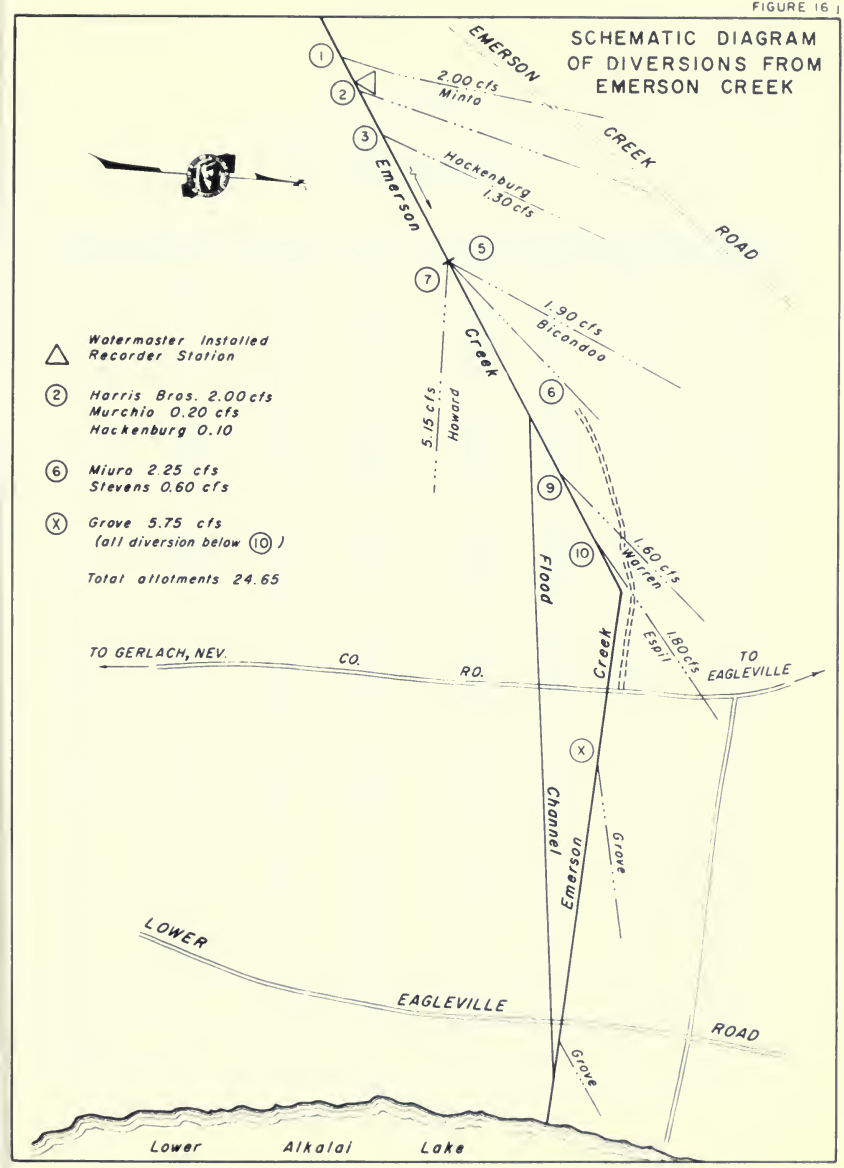

SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
EMERSON CREEK
EMERSON
CREEK
2.00 cfs
Minto
Hackenburg
1.30 cfs
ROAD
Emerson
1.90 cfs
Bicondoo
Creek
5.15 cfs
Howard
Watermaster Installed
Recorder Station
(2) Harris Bros. 2.00 cfs
Murchio 0.20 cfs
Hackenburg 0.10
(6) Miuro 2.25 cfs
Stevens 0.60 cfs
(X) Grove 5.75 cfs
(all diversion below (10))
Total allotments 24.65
1.60 cfs
Warren
Flood
Creek
Espil
1.80 cfs
TO GERLACH, NEV.
CO. RO.
TO
EAGLEVILLE
Channel
Emerson
Grove
LOWER
EAGLEVILLE
ROAD
Grove
Lower Alkalai Lake

TABLE 44
DAILY MEAN DISCHARGE

BIDWELL CREEK NEAR FORT BIDWELL

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	8.8	10	12	108	31	9.7	3.2
2	8.8	10	12	88	30	9.3	2.9
3	8.5	10	14	85	28	8.4	3.2
4	7.9	10	16	81	26	8.0	3.2
5	8.2	11	19	85	26	7.6	4.2
6	8.2	11	26	96	25	8.0	4.2
7	8.2	12	48	100	25	8.0	3.6
8	8.8	12	78	100	23	7.6	3.2
9	10	14	157	104	22	7.1	3.2
10	10	13	130	100	21	6.7	3.2
11	10	13	85	96	20	6.0	4.6
12	9.7	12	66	92	19	5.6	3.9
13	9.7	13	56	78	18	5.6	3.6
14	8.5	13	60	72	17	5.0	3.6
15	8.5	12	78	75	16	4.6	3.6
16	12	12	146	75	19	4.6	3.6
17	15	12	201	78	18	4.2	3.6
18	15	12	260	75	16	4.2	3.9
19	14	11	279	78	15	4.2	3.6
20	13	11	292	78	15	4.2	3.9
21	13	11	306	75	15	3.9	3.6
22	13	11	318	66	14	3.9	4.2
23	13	11	318	58	13	3.9	4.2
24	13	11	279	51	13	3.9	3.6
25	12	11	239	48	12	3.6	2.9
26	12	12	163	44	11	4.6	2.9
27	12	12	151	42	11	4.6	3.2
28	12	12	157	40	11	3.9	3.6
29	12	12	175	36	11	3.6	4.2
30	11	12	146	33	11	3.2	4.2
31	11		126		11	3.2	
Mean	10.9	11.6	142	74.6	18.2	5.5	3.6
Runoff in acre-feet	668	692	8750	4440	1120	339	215

TABLE 45
DAILY MEAN DISCHARGE

MILL CREEK ABOVE ALL DIVERSIONS

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1		3.7*	3.4	40	22	3.0	2.0
2		3.7	3.4	36	20	2.9	2.0
3		3.7	4.1	36	20	2.8	2.0
4		3.9	5.3	36	18	2.7	2.0
5		3.9	4.4	39	17	2.7	2.1
6		4.1	4.9	43	17	2.7	2.1
7		4.4	10	46	17	2.7	2.0
8		4.9	22	46	16	2.7	2.0
9		4.9	33	43	15	2.6	2.0
10		5.1	25	42	14	2.5	2.0
11		4.4	17	42	13	2.5	2.0
12		4.4	20	40	12	2.4	2.0
13		4.4	22	42	12	2.4	2.0
14		5.1	25	42	11	2.4	2.0
15		6.9	37	42	10	2.4	2.0
16		6.9	40	42	11	2.3	2.0
17		5.3	43	42	10	2.3	2.0
18		3.9	50	40	8.3	2.3	2.0
19		3.0	53	40	6.1	2.3	2.0
20		2.9	55	39	5.7	2.3	2.0
21		2.8	59	38	6.1	2.3	2.0
22		2.9	60	37	5.3	2.2	2.0
23		3.0	60	34	4.9	2.2	2.0
24		3.0	62	31	4.4	2.2	2.0
25		3.5	64	30	3.9	2.2	2.0
26		5.1	57	29	3.7	2.2	2.0
27		5.7	55	28	3.7	2.2	2.0
28		5.3	55	27	3.5	2.2	2.0
29		3.9	55	25	3.7	2.1	2.0
30		3.5	50	23	3.4	2.1	2.0
31			44		3.3	2.0	
Mean		4.3	35.4	37.3	10.4	2.4	2.0
Runoff in acre-feet		254	2180	2220	636	148	119

* Beginning of Record

TABLE 46
DAILY MEAN DISCHARGE
SOLDIER CREEK ABOVE ALL DIVERSIONS
March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1		[illegible]	3.5	14	[illegible]	2.2	1.4
2		[illegible]	[illegible]	11	[illegible]	2.2	1.4
3		3.5	3.7	12	[illegible]	2.1	1.4
4		3.3	[illegible]	13	2.	2.2	1.4
5		3.3	4.	13	2.	2.2	1.4
6		3.	12	10	[illegible]	2.2	1.4
7		[illegible]	7.7	[illegible]	[illegible]	2.1	1.4
8		3.	3.	7.7	2.	2.1	1.4
9		3.	2.	6.	2.	2.0	1.4
10		[illegible]	[illegible]	[illegible]	2.6	2.0	1.4
11		[illegible]	3.3	[illegible]	[illegible]	[illegible]	1.4
12		[illegible]	[illegible]	4.	2.	2.0	1.4
13		[illegible]	[illegible]	3.	2.4	2.0	1.4
14		3.	12	3.	2.5	1.9	1.4
15		[illegible]	11	3.	[illegible]	1.9	1.4
16		3.	21	[illegible]	2.6	1.9	1.3
17		3.	2[illegible]	[illegible]	[illegible]	1.9	1.3
18		[illegible]	34	[illegible]	[illegible]	1.7	1.3
19		3.3	41	[illegible]	2.4	1.7	1.3
20		3.3	47	[illegible]	[illegible]	1.6	1.3
21	5.3*	[illegible]	[illegible]	[illegible]	2.5	1.6	1.3
22	4.4	3.0	[illegible]	[illegible]	2.5	1.6	1.3
23	4.2	[illegible]	43	[illegible]	[illegible]	1.5	1.3
24	4.0	[illegible]	35	3.0	[illegible]	1.5	1.3
25	3.8	[illegible]	[illegible]	[illegible]	[illegible]	1.5	1.3
26	3.7	[illegible]	[illegible]	[illegible]	[illegible]	1.5	1.3
27	3.5	[illegible]	22	[illegible]	2.4	1.5	1.3
28	3.3	[illegible]	21	[illegible]	2.3	1.5	1.3
29	3.0	[illegible]	19	3.3	2.3	1.5	1.3
30	3.0	[illegible]	18	[illegible]	[illegible]	1.5	1.3
31	3.3		16		2.2	1.4	
Mean	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.4
Runoff in acre-feet	[illegible]82	[illegible]20	1160	[illegible]33	15	[illegible]18	[illegible]0

* Beginning of R[illegible]rd

TABLE 47
DAILY MEAN DISCHARGE

PINE CREEK AT NORTH AND SOUTH DIVERSION

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1		2.2	3.0	5.0	0.2		
2		2.3	3.0	6.5	0.2		
3		2.3	4.1	7.7	0.2		
4		2.3	5.5	7.5	0.2		
5		2.2	7.9	8.7	0.1		
6		2.2	11	12	0.1		
7		2.9	23	9.9	0.1		
8		3.3	27	7.7	0.1		
9		3.5	23	6.8	0.1		
10		3.6	18	6.4	0.1		
11		3.3	15	5.0	0.0**		
12		3.3	13	4.4			
13		3.8	15	4.1			
14		3.9	20	3.6			
15		3.8	34	3.1			
16		3.5	46	2.5			
17		3.5	50	2.0			
18		3.2	42	1.6			
19		2.9	32	1.3			
20	3.8*	3.0	15	1.1			
21	3.9	3.0	15	0.8			
22	3.8	3.2	14	0.6			
23	3.8	3.0	9.8	0.5			
24	3.5	2.9	5.6	0.5			
25	3.1	3.0	5.5	0.4			
26	2.6	3.2	6.1	0.3			
27	2.6	3.2	4.8	0.3			
28	2.5	3.3	4.7	0.3			
29	2.5	3.2	4.8	0.2			
30	2.4	3.0	4.1	0.2			
31	2.4		4.2				
Mean	3.1	3.1	15.7	3.7	0.1		
Runoff in acre-feet	73	182	968	220	2.8		

* Beginning of record
** No flow for remainder of season

TABLE 48
DAILY MEAN DISCHARGE
CEDAR CREEK AT CEDARVILLE

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	4.2	6.4	9.1	17	3.8	0.9	0.3
2	4.1	6.4	9.1	17	3.0	0.8	0.2
3	4.0	6.6	9.1	17	2.8	0.8	0.2
4	4.1	6.6	11	17	2.8	0.8	0.3
5	3.8	6.7	13	17	2.6	0.8	0.4
6	3.8	6.9	15	18	2.3	0.8	0.3
7	3.8	7.5	18	17	2.2	0.8	0.3
8	4.0	8.0	22	17	2.1	0.7	0.2
9	4.3	8.4	21	16	1.9	0.7	0.2
10	4.2	8.4	20	16	1.9	0.6	0.2
11	4.5	8.6	19	15	1.7	0.6	0.3
12	4.5	8.6	18	14	1.6	0.6	0.3
13	4.6	8.6	19	13	1.4	0.6	0.3
14	4.5	8.9	19	12	1.5	0.6	0.3
15	4.5	8.8	20	12	1.6	0.5	0.2
16	5.8	9.1	21	11	1.4	0.4	0.3
17	6.4	9.1	21	10	1.3	0.4	0.3
18	6.4	9.1	21	9.3	1.5	0.4	0.3
19	6.2	9.1	20	8.8	1.6	0.4	0.3
20	6.1	9.1	20	7.8	1.5	0.4	0.2
21	6.4	8.8	20	7.3	1.4	0.4	0.2
22	6.7	8.4	20	6.9	1.3	0.3	0.2
23	6.9	8.8	20	6.4	1.2	0.3	0.2
24	6.7	8.3	19	5.4	1.1	0.3	0.2
25	6.7	8.8	19	4.7	1.3	0.3	0.2
26	6.6	8.8	18	4.5	1.3	0.4	0.2
27	6.4	8.8	18	4.1	1.3	0.4	0.3
28	6.4	9.3	17	4.1	1.2	0.3	0.2
29	6.4	9.5	18	4.5	1.2	0.3	0.2
30	6.6	9.1	17	4.2	1.1	0.3	0.3
31	6.4		17		1.0	0.3	
Mean	5.4	8.3	17.7	11.2	1.8	0.5	0.3
Runoff in acre-feet	329	496	1090	665	108	32	15

TABLE 49
DAILY MEAN DISCHARGE

NORTH DEEP CREEK ABOVE ALL DIVERSIONS

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1		3.7*	5.2	8.1	2.8	0.4	0.3
2		3.5	5.2	7.0	2.3	0.4	0.3
3		3.7	5.5	6.8	2.0	0.4	0.3
4		3.7	5.8	7.0	1.8	0.4	0.3
5		3.9	6.9	7.2	1.5	0.3	0.3
6		4.1	8.8	8.8	1.3	0.4	0.3
7		4.4	11	9.2	1.3	0.4	0.3
8		4.4	13	8.5	1.3	0.4	0.3
9		4.6	14	8.5	1.2	0.4	0.3
10		4.9	13	8.1	1.2	0.3	0.3
11		4.4	11	8.1	1.2	0.3	0.3
12		4.1	9.2	8.1	1.1	0.3	0.3
13		3.9	9.2	7.5	1.1	0.4	0.3
14		4.1	9.5	7.2	1.0	0.4	0.3
15		3.9	8.5	6.8	1.0	0.3	0.3
16		3.7	7.6	6.0	0.9	0.3	0.3
17		4.1	8.8	6.0	0.8	0.3	0.3
18		4.6	9.8	5.2	0.8	0.3	0.3
19		4.4	13	4.6	0.7	0.3	0.3
20		4.1	14	4.4	0.7	0.3	0.3
21		4.1	17	4.4	0.7	0.3	0.3
22		4.1	18	3.9	0.6	0.3	0.3
23		3.9	18	3.7	0.6	0.3	0.3
24		3.9	14	3.5	0.5	0.3	0.3
25		4.1	13	3.5	0.5	0.3	0.3
26		4.4	10	3.5	0.5	0.4	0.3
27		4.6	9.8	3.2	0.5	0.4	0.3
28		5.2	9.8	3.2	0.5	0.4	0.3
29		5.5	9.2	3.0	0.5	0.4	0.3
30		5.5	8.8	2.8	0.5	0.4	0.3
31			8.5		0.5	0.4	
Mean		4.2	10.5	5.9	1.0	0.3	0.3
Runoff in acre-feet		253	645	353	63	21	18

* Beginning of record

TABLE 50
DAILY MEAN DISCHARGE
SOUTH DEEP CREEK ABOVE ALL DIVERSIONS
March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1		4.7*	4.0	6.7	2.6	0.5	0.3
2		4.7	4.0	6.5	2.5	0.4	0.3
3		4.6	4.1	6.2	2.4	0.4	0.3
4		4.6	4.1	6.1	2.3	0.4	0.3
5		4.7	4.1	5.7	2.2	0.4	0.3
6		4.8	4.6	5.7	2.2	0.4	0.3
7		4.9	4.9	5.6	2.2	0.4	0.3
8		5.0	5.2	5.5	1.9	0.3	0.3
9		4.9	5.3	5.5	1.8	0.3	0.3
10		4.9	5.6	5.4	1.7	0.3	0.3
11		4.8	6.0	5.2	1.5	0.3	0.3
12		4.7	6.2	5.1	1.4	0.3	0.3
13		4.8	6.2	5.0	1.4	0.3	0.3
14		4.9	6.6	4.9	1.3	0.3	0.3
15		4.9	6.7	4.7	1.2	0.3	0.3
16		4.8	7.1	4.6	1.2	0.3	0.3
17		4.9	7.3	4.5	1.2	0.3	0.3
18		4.8	7.6	4.1	1.1	0.3	0.3
19		4.7	8.0	4.0	1.1	0.3	0.3
20		4.6	8.2	3.9	1.0	0.3	0.3
21		4.6	8.6	3.9	0.9	0.3	0.3
22		4.5	8.7	3.8	0.8	0.3	0.3
23		4.2	8.6	3.7	0.7	0.3	0.3
24		4.2	8.1	3.5	0.6	0.3	0.3
25		4.2	8.0	3.4	0.5	0.3	0.3
26		4.5	7.9	3.3	0.5	0.3	0.3
27		4.5	7.8	3.2	0.5	0.3	0.3
28		4.2	7.5	3.1	0.5	0.3	0.3
29		4.1	7.2	3.0	0.5	0.3	0.3
30		4.0	6.9	2.9	0.5	0.3	0.3
31			6.8		0.5	0.3	
Mean		4.6	6.5	4.6	1.3	0.3	0.3
Runoff in acre-feet		275	400	275	81	20	18

* Beginning of record

TABLE 51
DAILY MEAN DISCHARGE

OWL CREEK BELOW ALLEN-ARRECHE DITCH

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1		3.7 *	3.4	48	34	5.3	1.7
2		3.7	3.7	42	32	4.8	1.7
3		3.7	4.3	43	30	4.2	1.7
4		3.8	5.5	41	28	3.8	1.7
5		3.9	6.1	44	26	3.5	1.7
6		3.9	8.1	53	24	3.5	1.6
7		3.9	20	49	22	3.5	1.6
8		4.0	16	54	20	3.3	1.6
9		4.1	14	54	19	3.1	1.6
10		4.1	21	54	17	3.0	1.6
11		3.7	17	57	16	2.9	1.6
12		3.8	14	47	14	2.8	1.6
13		4.1	13	47	13	2.6	1.6
14		4.2	16	44	13	2.5	1.5
15		4.0	25	43	12	2.4	1.5
16		3.7	32	48	12	2.4	1.5
17		3.5	42	55	12	2.4	1.5
18		3.2	55	58	10	2.3	1.6
19		3.0	57	61	10	2.3	1.6
20		2.9	56	63	9.8	2.3	1.5
21		2.9	56	64	9.1	2.2	1.5
22		2.9	60	64	8.9	2.2	1.4
23		2.9	67	52	8.2	2.2	1.4
24		3.0	61	45	7.5	2.1	1.3
25		3.0	59	42	7.0	2.1	1.3
26		3.0	62	43	6.6	2.1	1.2
27		3.0	58	46	6.2	2.0	1.2
28		3.0	54	43	6.0	1.9	1.1
29		3.1	49	38	6.0	1.9	1.1
30		3.1	44	36	5.8	1.9	1.1
31			49		5.6	1.8	
Mean		3.5	33.8	49.3	14.5	2.8	1.5
Runoff in acre-feet		208	2080	2930	894	169	90

* Beginning of record

TABLE 52
DAILY MEAN DISCHARGE
RADER CREEK ABOVE ALL DIVERSIONS
March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1		0.6*	0.5	26	22	2.9	2.1
2		0.6	0.5	26	20	2.9	2.1
3		0.6	0.5	27	20	2.8	2.1
4		0.6	0.6	27	19	2.8	2.1
5		0.6	0.8	27	19	2.8	2.1
6		0.6	1.2	27	18	2.7	1.9
7		0.6	2.1	28	17	2.7	1.9
8		0.6	2.7	28	15	2.7	1.7
9		0.6	2.3	31	15	2.5	1.6
10		0.6	1.1	30	13	2.5	1.4
11		0.6	1.0	30	12	2.4	1.4
12		0.6	0.8	28	11	2.3	1.3
13		0.7	0.7	27	10	2.1	1.3
14		0.7	0.7	26	9.4	1.7	1.1
15		0.7	2.3	27	8.9	1.6	1.1
16		0.7	6.2	29	8.0	1.4	1.1
17		0.7	8.5	30	8.0	1.4	1.0
18		0.6	14	31	7.1	1.3	1.0
19		0.6	15	32	6.4	1.4	0.9
20		0.6	15	30	5.9	1.6	0.9
21		0.5	19	28	5.1	1.7	0.8
22		0.5	26	27	4.6	1.9	0.8
23		0.5	24	27	4.6	1.9	0.8
24		0.5	26	27	4.2	1.9	0.8
25		0.5	24	28	4.2	1.9	0.8
26		0.5	25	27	3.8	1.9	0.8
27		0.5	26	27	3.8	1.9	0.8
28		0.5	26	26	3.6	2.1	0.8
29		0.5	25	25	3.6	2.1	0.8
30		0.5	26	24	3.6	2.1	0.8
31			26		2.9	2.1	
Mean		0.6	11.3	27.8	10.0	2.1	1.3
Runoff in acre-feet		35	693	1650	612	131	76

* Beginning of record

TABLE 53
DAILY MEAN DISCHARGE

Eagle Creek at Eagleville

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	1.6	2.1	1.3	21	30	5.3	2.6
2	1.6	1.9	1.3	20	29	5.1	2.6
3	1.6	1.7	1.6	21	27	4.9	2.8
4	1.7	1.6	1.9	23	27	4.9	2.8
5	1.7	1.6	1.9	23	24	4.7	2.9
6	1.9	1.6	2.6	23	22	4.5	2.6
7	2.1	1.6	6.9	24	22	4.3	2.5
8	2.2	1.6	13	27	20	4.1	2.4
9	2.4	1.7	16	30	18	3.9	2.4
10	2.2	1.9	10	30	17	3.9	2.4
11	2.2	1.9	8.0	28	17	3.7	2.4
12	2.1	1.9	6.6	22	16	3.7	2.2
13	2.2	1.9	6.2	22	14	3.6	2.2
14	2.4	1.9	7.6	21	13	3.6	2.0
15	2.4	1.9	11	23	13	3.6	2.0
16	2.4	1.9	16	25	13	3.6	1.9
17	2.4	1.7	21	25	11	3.6	2.0
18	2.4	1.7	27	27	10	3.4	2.1
19	2.4	1.7	37	26	10	3.4	2.0
20	2.4	1.7	41	24	9.0	3.4	2.1
21	2.2	1.7	40	26	8.7	3.2	2.0
22	2.1	1.7	39	25	8.3	3.2	2.0
23	2.1	1.7	29	25	7.7	3.2	2.0
24	2.1	1.6	27	26	7.4	3.2	2.1
25	2.1	1.6	23	29	7.2	3.0	2.1
26	1.9	1.6	22	33	7.2	3.3	1.9
27	1.9	1.3	22	35	6.6	3.0	1.9
28	1.9	1.3	22	36	6.6	2.9	1.9
29	2.1	1.3	23	36	6.3	2.9	1.9
30	2.1	1.3	23	31	5.7	2.9	1.9
31	2.1		23		5.4	2.8	
Mean	2.1	1.7	17.1	26.2	14.2	3.7	2.2
Runoff in acre-feet	129	100	1050	1560	871	228	132

TABLE 54
DAILY MEAN DISCHARGE

EMERSON CREEK ABOVE ALL DIVERSIONS

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1		2.6*	2.5	18	10	2.8	2.5
2		2.6	2.5	16	9.5	2.8	2.4
3		2.6	2.6	17	8.5	2.8	2.4
4		2.6	2.7	18	8.0	2.8	2.5
5		2.7	2.9	17	7.6	2.8	2.5
6		2.7	3.5	17	6.8	2.8	2.6
7		2.7	6.0	18	6.0	2.8	2.6
8		2.8	12	20	5.6	2.7	2.6
9		2.8	17	21	5.0	2.7	2.6
10		2.8	16	22	4.6	2.7	2.6
11		2.7	12	22	4.3	2.6	2.6
12		2.7	8.5	22	4.0	2.6	2.6
13		2.7	10	22	4.0	2.6	2.6
14		2.8	12	21	4.0	2.6	2.6
15		2.7	17	20	4.0	2.6	2.6
16		2.8	20	20	3.8	2.6	2.6
17		2.7	28	21	3.8	2.6	2.6
18		2.7	35	23	3.8	2.6	2.6
19		2.7	37	21	3.8	2.6	2.6
20		2.6	38	20	3.5	2.6	2.6
21		2.6	40	20	3.5	2.6	2.6
22		2.6	46	20	3.1	2.6	2.6
23		2.6	41	18	3.0	2.6	2.6
24		2.6	37	18	3.0	2.6	2.6
25		2.5	32	17	2.9	2.6	2.6
26		2.5	29	16	2.9	2.6	2.6
27		2.5	27	15	2.9	2.6	2.6
28		2.5	25	14	2.9	2.6	2.6
29		2.6	24	12	2.9	2.5	2.6
30		2.5	22	11	2.9	2.5	2.6
31			21		2.9	2.5	
Mean		2.6	20.3	18.6	4.6	2.8	2.6
Runoff in acre-feet		158	1250	1100	285	173	153

* Beginning of record

Susan River Watermaster Service Area

The Susan River service area is located in the southern part of Lassen County in the vicinity of Susanville. There are 164 water right owners in the service area with total allotments of 351.732 cubic feet per second. The primary place of use is in Honey Lake Valley between Susanville and the northwest shore of Honey Lake, a distance of about 25 miles. The valley floor is at an elevation of about 4,000 feet. The source of supply is comprised of three stream systems: Susan River and tributaries, Baxter Creek and tributaries, and Parker Creek.

Susan River originates on the east slope of the Sierra Nevada immediately east of Lassen National Park at an elevation of about 7,900 feet. Its channel runs easterly from Silver Lake through McCoy Flat Reservoir, the town of Susanville, and then to Honey Lake.

Susan River has four major tributaries: Piute Creek, entering from the north at Susanville; Gold Run and Lassen Creeks, entering from the south between Susanville and Johnstonville; and Willow Creek, entering from the north above Standish. Gold Run and Lassen Creeks rise on the north slope of Diamond Mountain at an elevation of about 7,600 feet. The watersheds of Piute and Willow Creeks are on the south slopes of Round Valley Mountain at lower elevations.

A short distance below its confluence with Willow Creek the Susan River divides into three channels: Tanner Slough Channel on the north, Old Channel in the middle, and Dill Slough Channel on the south. Hartson Slough and Whitehead Slough divert from Dill Slough on its south bank farther downstream.

The Baxter Creek stream system is located in Honey Lake Valley on the east slope of the Sierra Nevada about 10 miles southeast of Susanville. The principal creeks in the system are: Baxter Creek, which rises in the extreme western portion of the basin and flows in an easterly direction; Elesian Creek, Sloss Creek, and Bankhead Creek are tributaries of Baxter Creek from the south.

Parker Creek is situated in Honey Lake Valley on the east slope of the Sierra Nevada about 15 miles southeast of Susanville. It rises on the east slope of Diamond Mountain and flows in a easterly direction for about five miles into Honey Lake.

A schematic drawing of each major stream system within the Susan River service area is presented as Figures 17 through 17e, pages 251 through 261.

Water Supply

The water supply in the Susan River service area is obtained from two major sources, snowmelt runoff and springs. Snowpack on the Willow Creek Valley and Piute Creek watersheds, which embrace more than one-half of the Susan River stream system, melts early in the spring and is usually depleted by May 1. Irrigation requirements from this portion of the stream system are then almost entirely dependent on the flow of springs that are relatively constant throughout the year.

Under average flow conditions, Lassen, Gold Run, Baxter, and Parker Creeks and Susan River above Susanville are sustained by snowmelt runoff until early June. The flow from perennial springs in this portion of the system is comparatively small.

The Lassen Irrigation District stores supplemental water in Hog Flat and McCoy Reservoirs, located on the headwaters of the Susan River. This stored water is released into the Susan River channel and commingled with the natural flow, usually during June and July. It is then rediverted into Lake Leavitt for further distribution by the irrigation district.

Records of the daily mean discharge of the several stream gaging stations in the service area are presented in Tables 55 through 63, pages 263 through 271.

Methods of Distribution

Irrigation in the Susan River service area is accomplished by placing dams in the main channels, thus raising the water level for subsequent diversion into canals and ditches. These diversion dams are

relatively large on the Susan River channel and much smaller on the tributaries. Wild flooding is the most common method of irrigation in practice. Portions of the irrigated lands have been leveled, permitting a more efficient use of water by using border checks and furrows. Subirrigation occurs in some areas incidental to surface irrigation or as a result of seepage from ditches and creek channels.

The Lassen Irrigation Company is entitled to divert or store up to the present capacity of its reservoirs from the natural flow of Susan River between March 1 and July 1 of each year when the flow of the Susan River immediately above Willow Creek is greater than 20 cubic feet per second. The company may divert at all other times when the flow of the Susan River immediately above Willow Creek is more than 5 cubic feet per second in spite of the allotments granted to users in Schedules 3 and 6 and to users of third priority class in Schedule 5 of the Susan River decree. When the flow of the Susan River immediately above Willow Creek is below the required amount the watermaster then measures the inflow to McCoy Flat Reservoir and if available, releases the amount required. A transportation loss of 15 percent,or a minimum of two cubic feet per second,is deducted from all water transferred from Lassen Irrigation Company upstream storage reservoirs, to Lake Leavitt.

The several decrees (see Table 1) which apply to the Susan River service area establish the following number of priority classes for the major stream systems and distribution areas: Baxter Creek - five; Parker Creek - four; Gold Run Creek - three; Lassen Creek - two; Piute and Hills Creek - one; Willow Creek - two; and Susan River - three. Geographical features are such that the Susan River, Willow Creek, and Lower Susan River areas are subject to interrelated priorities.

1967 Distribution

Watermaster service began March 27 in the Susan River service area and continued until September 30. Kenneth E. Morgan, Water Resources Engineering Associate, was watermaster during this period.

The available natural flow water supply throughout the Susan River

service area was well above average. An unusually heavy snowfall during April brough the May 1 snow survey messurements to about 200 percent of normal for the Susan River watershed. Many ranchers in the Honey Lake Valley reported record hay crop yields.

Parker Creek. The available water supply in Parker Creek was sufficient to satisfy all allotments (four priorities) until June 20. From June 20 to July 10 the flow decreased rapidly to first priority allotments. From July 10 throughout the remainder of the season only first priority allotments (stockwater) were served.

Baxter Creek. The available water supply in Baxter Creek was sufficient to supply all allotments (five priorities) until June 23. The flow rapidly decreased from June 25 to July 1 when approximately 50 percent of third priority allotments were supplied. From July 15 through September 30 the flow remained reasonably constant at approximately 50 percent of first priority allotments, providing some irrigation water for the upper users and stockwater for the lower users.

Lassen-Holtzclaw Creek. The available water supply in Lassen-Holtzclaw Creek was sufficient to meet all allotments (two priorities) until July 5. The flow decreased to first priority allotments on August 5. From August 5 throughout the remainder of the season the Tangeman Ranch was entitled to all of the water available in the stream system.

Hills Creek. The available water supply in Hills Creek was sufficient to supply all allotments (one priority) until about July 15. From August 1 through September 30 approximately 50 percent of the total allotments were served. All storage facilities on Hills Creek were filled during spring runoff.

Gold Run Creek. The available water supply in Gold Run Creek was sufficient to supply all allotments (three priorities) until July 5. From July 5 to August 1 the flow rapidly decreased to approximately 10 percent of second priority allotments. From August 1 through September 30 the flow remained reasonably constant at about 10 percent of second priority allotments.

Piute Creek. The available water supply in Piute Creek was sufficient to satisfy all allotments (one priority) and also provide a small surplus flow to the Susan River throughout the season.

Willow Creek. The available water supply in Willow Creek was sufficient to satisfy all allotments (two priorities) throughout the season.

A problem of heavy growth of moss, weeds, etc., exists annually in Willow Creek during the summer months. From July 5 through August 28, the Hansen and Hagata ranches in this area would not drain sufficiently for haying operations. Therefore, on July 28 a second pump was installed in Willow Creek at Horse Lake Road to assist in diverting water to the Eagle Lake Canal. This resulted in a lowering of the water surface in Willow Creek which allowed the moss and weeds to dry out and the low lands to drain.

Susan River. The available water supply in Susan River was sufficient to satisfy all allotments in Schedule 6 (three priorities) until June 23. As the flow receded Schedule 6 was terminated for the season. All allotments in Schedule 3 (two priorities - Lower Susan River area) were satisfied until July 5. From mid-July throughout the remainder of the season there was enough water for about 50 percent of second priority allotments in this schedule.

All allotments in Schedule 5 (three priorities - Upper Susan River area) were satisfied until July 4. From mid-July to August 15 there was enough water for about 25 percent of second priority allotments in this schedule. From August 15 throughout the remainder of the season, water was available for 10 percent of second priority allotments.

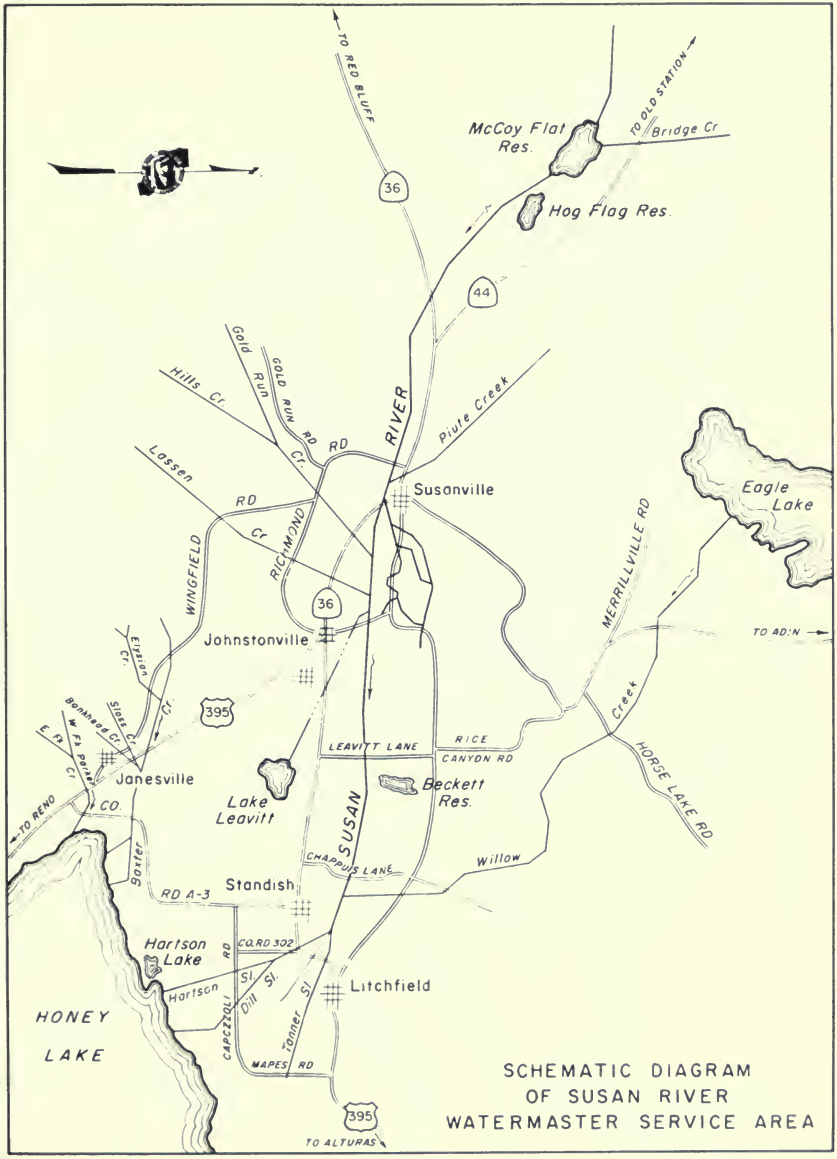
Lassen Irrigation Company Reservoirs. The Susan River decree allows the Lassen Irrigation Company's McCoy Flat and Lake Leavitt reservoirs to store surplus water during winter and spring months. Once filled, or if a shortage occurs among downstream water right owners, the natural flow in Susan River above McCoy Flat Reservoir must be released.

During early spring the above reservoirs filled to capacity. By July 4 the flow of Susan River became less than the evaporation losses in McCoy Flat Reservoir. Also, downstream water right owners were in need of additional water. Therefore, controlled releases had to be made. The Company requested that the required releases (equal to the inflow) from McCoy Flat Reservoir be made instead from their downstream Hog Flat Reservoir. This reservoir is quite shallow and has unusually high evaporation losses.

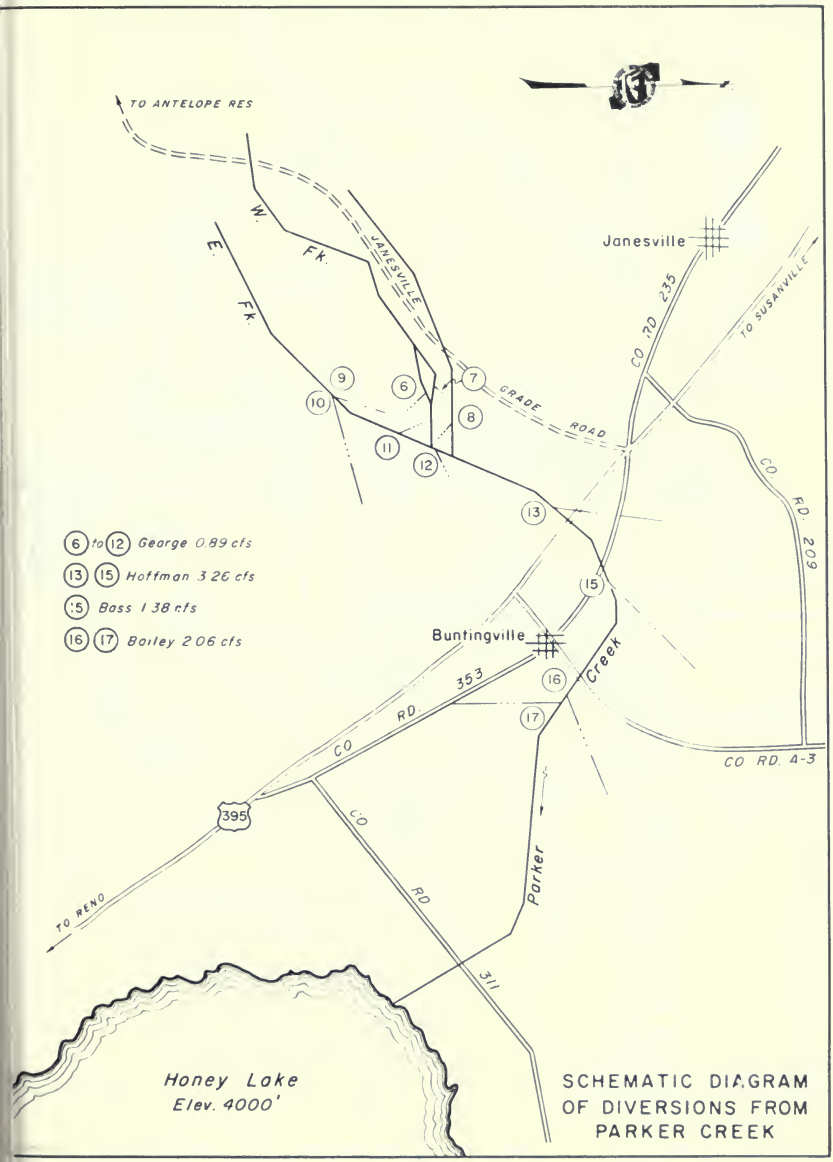
The watermaster granted permission to operate as requested. Consequently, between July 4 and July 14 at which time inflow to McCoy Flat Reservoir ceased for the summer, a total of 324 acre-feet was released from Hog Flat Reservoir for use by the downstream water right owners.

Special Occurrences

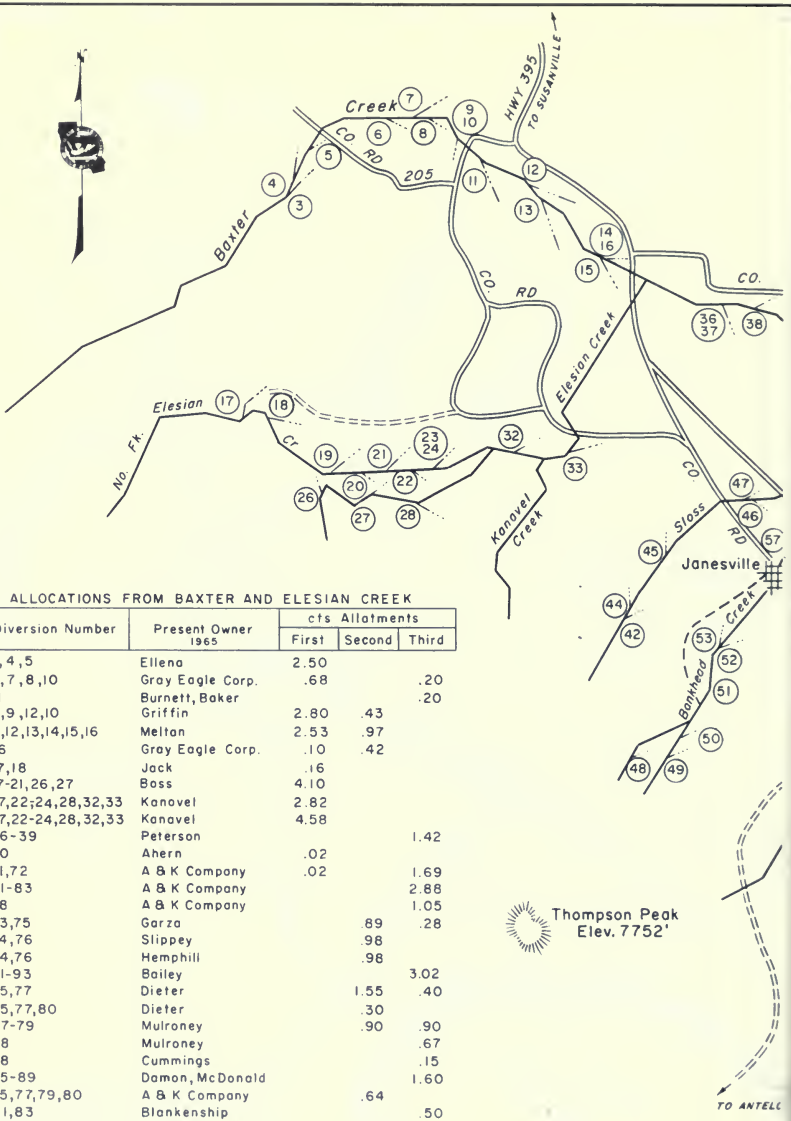
On July 20 an upright timber in the Lassen Irrigation Company diversion dam number 41 broke, sending approximately 130 cubic feet per second downstream. As a result the Barham Dam, diversion number 46 on the Susan River, was severely damaged. It was not in use for the remainder of the season. Water was again diverted into the diversion number 41 canal within nine hours after the break occurred.



SCHEMATIC DIAGRAM
OF SUSAN RIVER
WATERMASTER SERVICE AREA



SCHEMATIC DIAGRAM OF DIVERSIONS FROM PARKER CREEK



ALLOCATIONS FROM BAXTER AND ELESIAN CREEK

Diversion Number	Present Owner 1965	cfs Allotments		
		First	Second	Third
3,4,5	Ellena	2.50		
6,7,8,10	Gray Eagle Corp.	.68		.20
11	Burnett, Baker			.20
8,9,12,10	Griffin	2.80	.43	
8,12,13,14,15,16	Melton	2.53	.97	
16	Gray Eagle Corp.	.10	.42	
17,18	Jack	.16		
17-21,26,27	Boss	4.10		
17,22,24,28,32,33	Kanovel	2.82		
17,22-24,28,32,33	Kanovel	4.58		
36-39	Peterson			1.42
70	Ahern	.02		
71,72	A & K Company	.02		1.69
81-83	A & K Company			2.88
78	A & K Company			1.05
73,75	Garza		.89	.28
74,76	Slippey		.98	
74,76	Hemphill		.98	
91-93	Bailey			3.02
75,77	Dieter		1.55	.40
75,77,80	Dieter		.30	
77-79	Mulroney		.90	.90
78	Mulroney			.67
78	Cummings			.15
85-89	Damon, McDonald			1.60
75,77,79,80	A & K Company		.64	
81,83	Blankenship			.50
84,90	Triami Cattle Co.			1.81

ALLOCATIONS FROM SLOSS AND BANKHEAD CREEKS

Diversion Number	Present Owner 1965	cfs Allotments			
		First	Second	Third	Total
42	Bowersox	.02			0.02
44	Thornton	.002			0.002
45	Speors			.08	0.08
46	Grover	.10	1.10		1.20
46,47	Peterson	.10	1.10		1.20
48,49,50	Row	.02	.13		0.15
51	Holmes Pipeline	.08		.11	0.19
52,53,55	Pyle			.48	0.48
56,62	Ashmore	.25	3.23		3.48
63,65	Thomasson	.05		30	0.35
66,67	Fritts	06		20	0.26

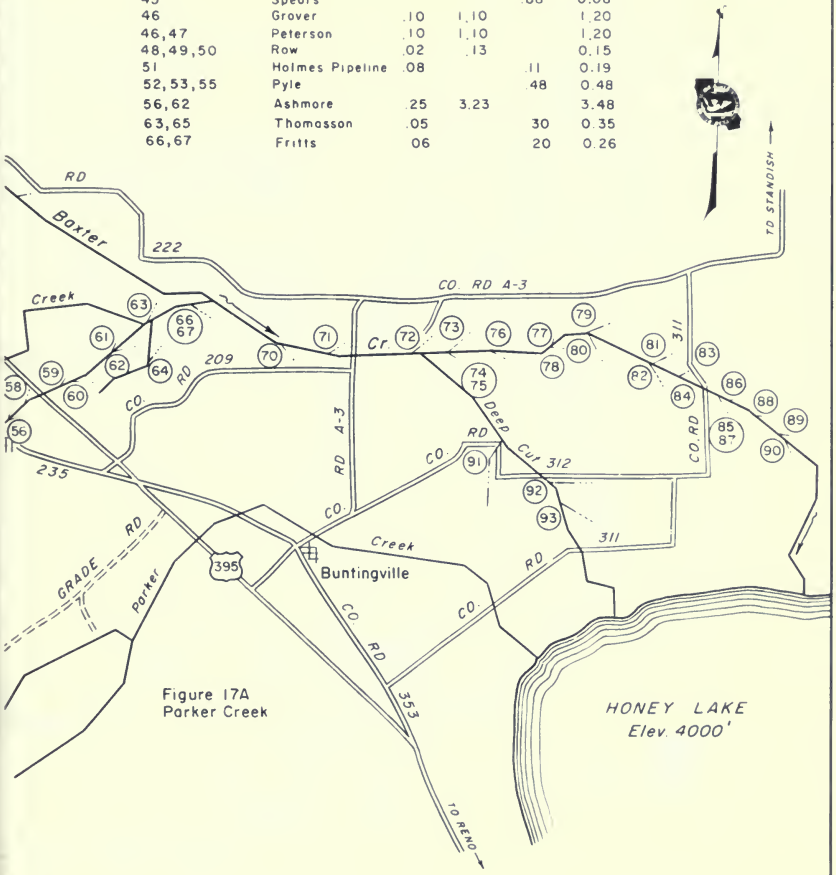
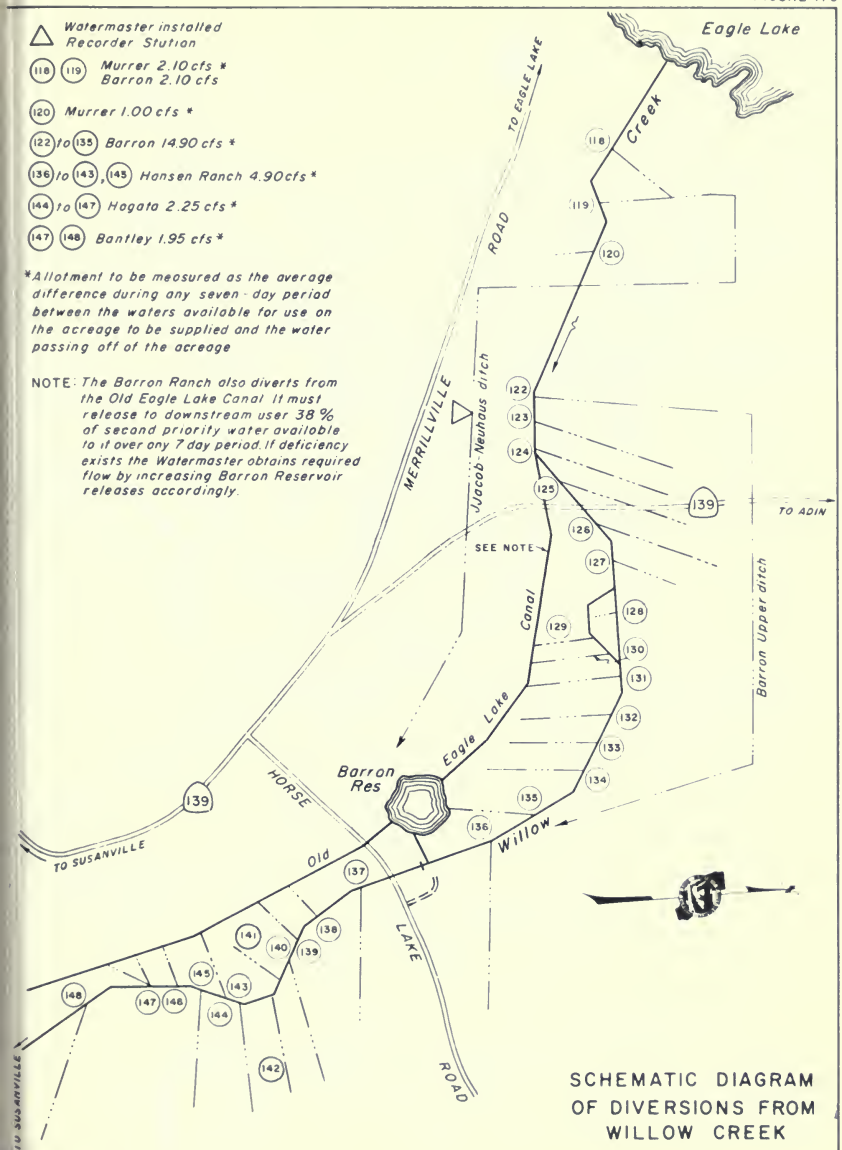
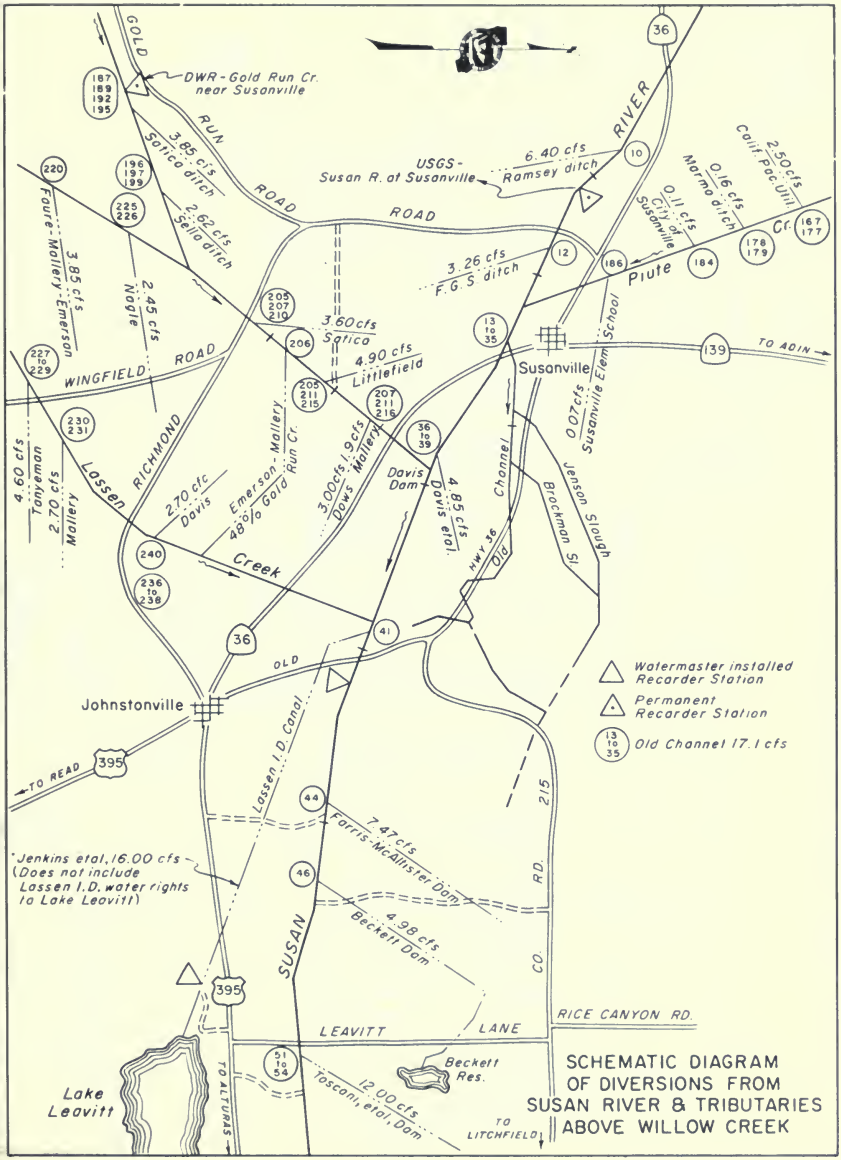


Figure 17A
Parker Creek

SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
BAXTER CREEK

PE RESERVOIR


Watermaster installed Recorder Stution
118 119 Murrer 2.10cfs * Barron 2.10 cfs
120 Murrer 1.00cfs *
122 to 135 Barron 14.90 cfs *
136 to 143, 145 Hansen Ranch 4.90cfs *
144 to 147 Hogata 2.25 cfs *
147 148 Bantley 1.95 cfs *
*Allotment to be measured as the average difference during any seven-day period between the waters available for use on the acreage to be supplied and the water passing off of the acreage
NOTE: The Barron Ranch also diverts from the Old Eagle Lake Canal It must release to downstream user 38% of second priority water available to it over any 7 day period. If deficiency exists the Watermaster obtains required flow by increasing Barron Reservoir releases accordingly.
Eagle Lake
TO EAGLE LAKE
ROAD
Creek
MERRILLVILLE
Jacob Neuhaus ditch
SEE NOTE
Canal
TO ADIN
Barron Upper ditch
Eagle Lake
Barron Res
HORSE
Old
Willow
LAKE
ROAD
TO SUSANVILLE
139
SCHEMATIC DIAGRAM OF DIVERSIONS FROM WILLOW CREEK



SCHEMATIC DIAGRAM OF DIVERSIONS FROM SUSAN RIVER & TRIBUTARIES ABOVE WILLOW CREEK

[3] = Schedule 3
[5] = Schedule 5
[6] = Schedule 6

(56), (94) to (96) Barry, Story, Froley, Mendiboure, Wagner — 2.00 cfs [3]; 1.95 cfs [6]

(71), (75) to (78) McClelland — 2.67 cfs [3]; 7.33 cfs [5]; 0.75 cfs [6]

(57), (58), (69) Gibson — 2.00 cfs [3]; 5.50 cfs [5]

(58) to (61), (79), (80), (84) Mapes — 2.91 cfs [3]; 8.03 cfs [5]; 2.35 cfs [6]

(81) to (83) DeWitt — 0.33 cfs [3]; 0.92 cfs [5]; 0.50 cfs [6]

Theodore — 0.50 cfs [3]; 1.38 cfs [5]; 2.60 cfs [6]

(85), (86) Calif Fish & Game — 3.33 cfs [3]; 9.17 cfs [5]; 6.70 cfs [6]

(82), (87) to (89), (91), (92) Capezzali, DeWitt — 2.00 cfs [3]; 5.50 cfs [5]

(99) (102) Beckett — 2.30 cfs [3]; 5.50 cfs [5]; 5.15 cfs [6]

(98), (100), (101) Bailey — 1.33 cfs [3]; 3.67 cfs [5]

(97) Tanner — 1.33 cfs [3]; 3.67 cfs [5]

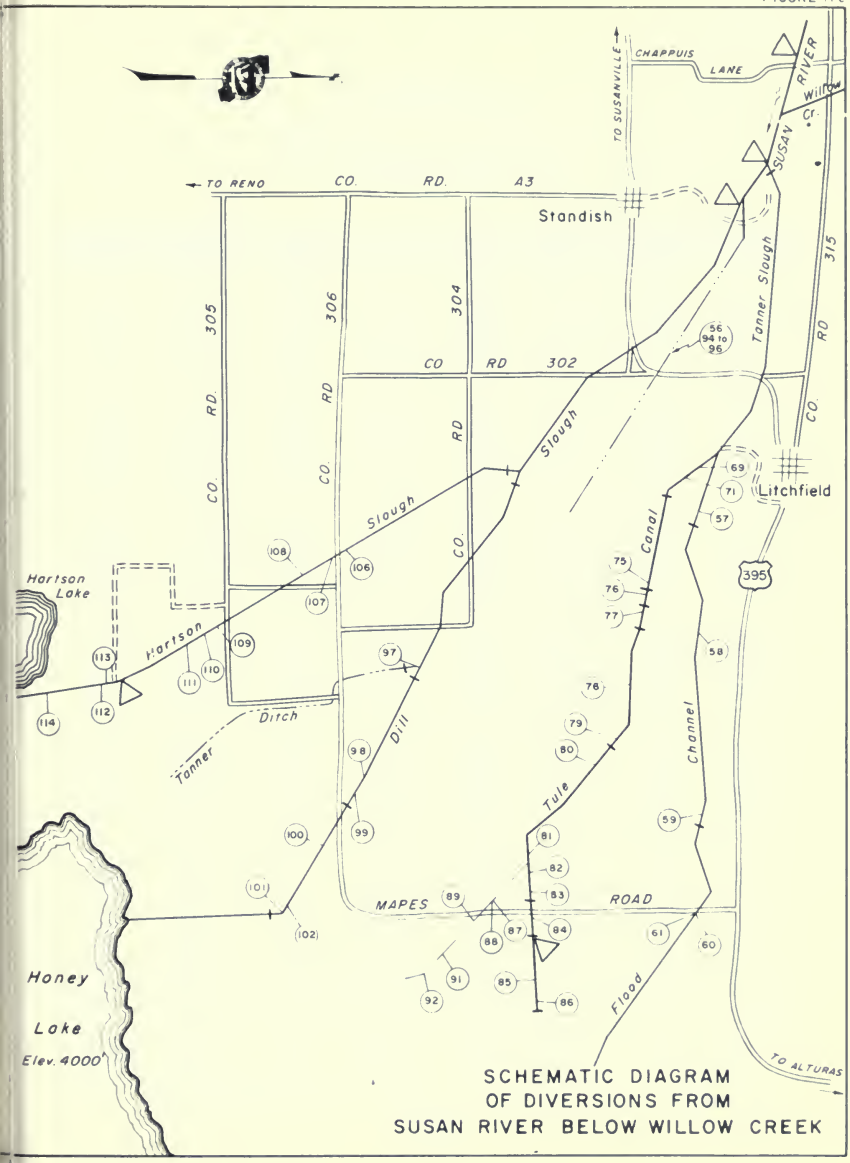
(106), (109) Buckner — 0.25 cfs [3]; 0.85 cfs [6]

(107), (108) Beckett — 0.25 cfs [3]; 0.95 cfs [6]

(110), (111) Anderson — 0.25 cfs [3]; 1.30 cfs [6]

(112) to (114) Calif Fish & Game 3.10 cfs [6]

△ Watermaster installed Recorder Station



SCHEMATIC DIAGRAM
OF DIVERSIONS FROM
SUSAN RIVER BELOW WILLOW CREEK

TABLE 55
DAILY MEAN DISCHARGE

SUSAN RIVER AT SUSANVILLE

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	101	140	94	516	118	108	4.2
2	106	133	105	408	104	108	4.7
3	102	133	116	351	65	104	4.2
4	92	127	135	295	55	104	5.1
5	86	121	162	306	62	109	7.7
6	86	125	192	315	60	112	6.9
7	89	124	278	330	57	114	7.3
8	91	125	432	342	54	112	6.5
9	101	135	512	357	52	109	6.5
10	114	138	436	351	52	108	6.0
11	106	127	330	348	50	102	6.5
12	95	122	288	372	48	112	7.1
13	102	132	280	380	46	111	4.9
14	94	135	309	351	34	108	5.1
15	88	124	396	288	24	115	5.1
16	513	115	508	248	24	118	5.1
17	596	118	580	241	29	123	5.3
18	448	122	610	258	22	109	7.3
19	333	116	620	381	126	49	6.7
20	290	114	625	420	146	26	5.7
21	303	111	650	354	134	20	5.7
22	303	102	958	336	118	16	6.3
23	408	105	1250	300	108	13	6.9
24	315	110	1280	226	102	10	6.3
25	262	105	1160	120	108	8.5	5.9
26	226	101	1030	98	106	8.3	5.5
27	208	103	886	90	112	7.9	5.5
28	204	100	742	84	112	8.1	5.3
29	182	95	660	88	112	7.1	5.5
30	164	91	605	98	109	5.7	5.5
31	158		576		111	5.1	
Mean	205	118	542	288	79.5	70.6	5.9
Runoff in acre-feet	12630	7050	33330	17160	4880	4310	351

TABLE 56
DAILY MEAN DISCHARGE
GOLD RUN CREEK NEAR SUSANVILLE

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	5.3	8.7	4.6	46	20	4.3	1.3
2	5.8	8.3	5.6	35	19	3.9	1.3
3	6.1	8.3	6.1	31	17	3.7	1.2
4	5.6	8.0	8.0	31	15	3.5	1.2
5	5.0	7.6	10	32	14	3.3	1.2
6	4.8	7.6	13	34	14	3.2	1.2
7	4.8	7.6	21	36	12	3.0	1.2
8	4.8	8.3	35	37	12	3.0	1.2
9	5.3	8.3	40	41	12	2.8	1.2
10	5.8	9.1	27	45	9.8	2.5	1.2
11	6.4	8.0	19	47	9.8	2.4	1.2
12	6.7	7.6	18	51	9.1	2.2	1.2
13	7.0	8.0	19	51	8.7	2.2	1.1
14	4.8	8.0	27	51	8.7	2.2	1.1
15	5.3	7.3	46	52	7.6	2.2	1.1
16	52	6.4	76	54	9.8	2.1	1.1
17	54	6.4	95	59	8.7	2.0	1.1
18	31	6.4	103	61	7.6	2.0	1.1
19	23	6.1	110	61	7.0	2.0	1.1
20	19	5.8	115	54	6.4	1.8	1.1
21	20	5.3	110	48	6.1	1.7	1.1
22	21	5.0	146	42	5.8	1.7	1.1
23	29	5.0	161	36	5.3	1.6	1.1
24	22	5.0	112	34	5.3	1.6	1.1
25	18	5.0	99	32	5.0	1.6	1.1
26	15	4.8	87	30	4.8	1.7	1.1
27	14	4.8	85	27	4.8	1.7	1.1
28	14	4.6	83	26	4.6	1.6	1.0
29	12	4.6	79	24	4.6	1.6	1.0
30	11	4.1	72	23	4.1	1.5	1.0
31	10		64		4.3	1.4	
Mean	14.5	6.7	61.2	41.0	9.1	2.3	1.1
Runoff in acre-feet	890	397	3760	2440	561	143	65

TABLE 57
DAILY MEAN DISCHARGE
SUSAN RIVER AT JOHNSTONVILLE BRIDGE

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1		*			92	4.0	1.8
2					48	3.9	1.8
3					42	3.8	1.8
4					46	3.7	1.8
5					50	3.6	1.8
6					55	3.6	1.7
7					45	3.6	1.6
8					20	3.6	1.6
9					37	3.7	1.6
10					36	3.5	1.5
11					32	3.0	1.5
12					22	3.0	1.4
13					21	2.7	1.4
14					19	2.6	1.4
15					20	2.4	1.4
16					21	2.2	1.4
17					27	2.0	1.4
18					24	2.0	1.4
19					15	1.9	1.4
20					100	1.7	1.4
21					28	1.6	1.4
22					16	1.8	1.4
23					11	1.8	1.4
24					11	2.0	1.4
25					11	2.0	1.4
26					10	2.0	1.4
27					6.2	2.0	1.4
28					4.9	1.9	1.4
29					6.2	1.9	1.4
30					4.3	1.9	1.4
31					4.1	1.8	
Mean					28.5	2.6	1.5
Runoff in acre-feet					1750	161	89

* Mean daily flow from April 1 to June 30 was in excess of 100 cfs.

TABLE 58
DAILY MEAN DISCHARGE

WILLOW CREEK NEAR SUSANVILLE

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	54	43	39	26	21	20	12
2	53	43	39	32	20	19	12
3	51	43	38	31	19	19	12
4	48	41	39	27	18	19	12
5	47	39	40	28	17	18	13
6	47	36	42	30	16	15	13
7	46	40	43	29	16	14	13
8	45	40	45	28	16	14	13
9	45	39	44	32	17	14	12
10	34	38	41	33	17	13	11
11	31	40	36	33	18	13	11
12	30	41	35	31	17	13	11
13	30	39	33	31	17	13	11
14	35	39	30	31	16	13	10
15	37	40	28	29	16	13	10
16	228	38	30	27	15	13	11
17	522	37	30	25	16	13	11
18	369	43	29	24	16	12	11
19	197	45	28	23	17	12	11
20	137	43	27	26	17	12	11
21	122	41	25	31	17	12	11
22	102	40	23	28	17	12	11
23	96	39	18	24	17	12	11
24	98	43	17	23	17	12	11
25	87	45	16	22	17	12	11
26	79	44	19	25	17	12	11
27	72	43	24	26	18	12	11
28	61	42	26	25	18	12	11
29	57	41	24	24	19	11	11
30	48	40	17	23	20	11	11
31	43		18		21	12	
Mean	95.2	40.8	30.4	27.6	17.4	13.6	11.4
Runoff in acre-feet	5850	2430	1870	1640	1070	837	676

TABLE 59
DAILY MEAN DISCHARGE

WILLOW CREEK NEAR LITCHFIELD

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1	73	56	45	31	24	19	16
2	68	56	44	37	23	19	15
3	67	56	44	39	22	19	15
4	61	53	43	34	21	18	14
5	60	50	44	33	20	18	14
6	60	46	46	35	19	18	14
7	58	53	46	36	18	19	13
8	56	52	48	37	19	19	13
9	56	49	48	39	19	19	13
10	49	48	48	41	20	19	13
11	43	50	44	39	20	19	13
12	49	51	44	38	21	19	13
13	44	49	40	36	21	19	13
14	48	47	36	36	21	18	12
15	52	50	33	34	21	18	12
16	786	47	34	32	20	18	12
17	1020	46	34	30	21	18	12
18	489	55	33	27	21	18	12
19	271	59	32	27	20	18	12
20	187	53	31	29	21	18	12
21	163	50	29	32	21	18	11
22	141	48	27	32	21	18	11
23	124	46	23	28	21	18	11
24	128	50	21	26	21	18	11
25	113	55	20	25	21	17	11
26	99	54	21	27	21	17	11
27	79	50	26	28	21	17	11
28	76	49	29	28	20	17	11
29	72	47	28	27	20	17	11
30	63	46	23	26	20	16	10
31	56		22		19	16	
Mean	152	50.7	35.0	32.3	20.6	18.0	12.4
Runoff in acre-feet	9340	3020	2150	1920	1260	1110	738

TABLE 60
DAILY MEAN DISCHARGE
SUSAN RIVER INFLOW TO McCOY FLAT RESERVOIR
March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1							
2							
3					30*		
4					28		
5					26		
6					23		
7					20		
8					15		
9					10		
10					5.0		
					3.0		
11					2.0**		
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
Mean					16.2		
Runoff in acre-feet					321		

* Beginning of record
** End of flow

TABLE 61
DAILY MEAN DISCHARGE

McCOY FLAT RESERVOIR RELEASES TO SUSAN RIVER

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1						29	
2						31	
3						31	
4						31	
5						42	
6						51	
7						54	
8						57	
9						62	
10						61	
11						63	
12						75	
13						79	
14						83	
15						93	
16						101	
17						107	
18					30*	99**	
19					45		
20					58		
21					47		
22					32		
23					20		
24					20		
25					22		
26					28		
27					30		
28					32		
29					30		
30					30		
31							
Mean					32.5	63.8	
Runoff in acre-feet					841	2280	

* Beginning of releases
** End of releases

TABLE 62
DAILY MEAN DISCHARGE
HOG FLAT RESERVOIR RELEASES TO SUSAN RIVER

March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1						64	
2						62	
3						60	
4					15*	58	
5					30	56	
6					30	54	
7					30	52	
8					30	50	
9					30	46	
10					29	43	
11					29	40	
12					29	36	
13					15**	33	
14						30	
15						27	
16						24	
17						21	
18					40*	18	
19					75	16	
20					75	13	
21					74	11	
22					73	9.0	
23					72	7.0	
24					71	4.0	
25					71	3.0	
26					70	2.0	
27					69	1.0**	
28					68		
29					67		
30					66		
31					65		
Mean					51.0	31.1	
Runoff in acre-feet					2430	1670	

* Beginning of releases
** End of releases

TABLE 63
DAILY MEAN DISCHARGE
TRANSFER OF LASSEN IRRIGATION DISTRICT WATER FROM
McCOY FLAT AND HOG FLAT RESERVOIRS TO LAKE LEAVITT
March through September 1967
(In second-feet)

Day	March	April	May	June	July	August	September
1						79	
2						79	
3						77	
4						76	
5						83	
6						89	
7						90	
8					8.0*	91	
9					12	92	
10					17	88	
11					22	88	
12					23	94	
13					11 **	95	
14						96	
15						102	
16						106	
17						109	
18						99	
19					102*	37	
20					113	21	
21					103	16	
22					89	10	
23					78	5.0	
24					77	2.0**	
25					79		
26					83		
27					84		
28					85		
29					83		
30					82		
31					81		
Mean					64.8	71.2	
Runoff in acre-feet					2440	3420	

* Beginning of releases
** End of releases